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COMMONPLACE-BOOK.

Challes of the Sold of the Sandy

7531. In English, on paper: written in 3 hands in the 18th cent.: $8\frac{1}{4} \times 6\frac{1}{4}$ in., 138 leaves.

Notes on natural science, extracted from various works published before 1740; arranged alphabetically; with some figures. Lettered on lower edge 'Mis[cellanea] Φ Vol: 1st'. 42 leaves are blank.

The sources include: Power, no. 3730; Ozanam's 'Math. and phys. recreations', 1708; Geo. Cheyne's 'Philos. principles', 1715; Boyle's works, abridged by Shaw, 1725 or '38; N. Regnault's 'Entretiens physiques', tr. by Th. Dale, 1731; &c.

FROM
THE LIBRARY
OF
SIR WILLIAM OSLER, BART.
OXFORD

for God requires agua Regalis, & silver agua fortis. which also des olves all other metals AL A B OF G Lattida Luna pluit, rubiertoa flat, alba serenat. 112 al See correspondence from Henry Viets, October 3, 1966 for possible correction re Cheyne's Phil. Prin. Nat. Religion . 1. (Porder 's very large pop' 2. Denyed ariaming date 194?? 6. 'Ozman's math "friend Recreations' A Jusques Organam, 1640-1717. 2 his Recreations in health anatices (1xed.) 1803 . Pro Potria 7. Borle, "php. Was. abridua y Show", 1725 +38. 16. N. Kegnanet. Introliens shyregers 1729; tr. Ly Thos. Del, Lond. 1731, 3000. (wat : dos - office Sug. tolle . well here "Dale's Phy, vol. 1") Only concertion of years 22. Dopalais astro theolog, 1715. are leaf 23%. 23. Ma French shows about 40 pract that 2023 the fundale vilvates the sloover, it wears tothe squator. Sun inglish 173/4
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for God requires agua Regalis, & silver agua fortis. which also elisolves all other enerals AZ OF G Pollida Luna pluit, rabierda flat, abba serenat. Casyno's Thile Prine Esc. to the Bank of Montreal, West 1, for credit of your account, \$25.00 being monthly allowance rust - \$50.00 less payment to . Pro Potana \$25.00 Yours faithful Outremention of years F.A. Lister For Manage 92 - Nevy harten Philos Srammer, >98 Riscours with him godfor, it chemist 1 1.0 phlembore 3. - father as some died 1741 & 175-6. 111 Bradley (ches) Phil Ace. of the of Notice ra &

Allitude The altitude of the sun or star is its height above the Kortzon measured by the Degrees on the Quadrant of altitudes. The azimuth of a sun or star is its distance Azimuth. from any of the four Cardinal points E. W. N. S. measured by the degrees on the Horizon not when it is spoken of the Sun's azimuth in gen the distance from the South is meant. The amplitude of the sun or star is its East or west azmuth at its vising or setting aqua Tortis. Put a small quantity of aqua Fortis 8 of the filings of Braf into a bothe & it with Immediate seeme to Boile oil of Faster or oil of eithior mixt will also causes agua Regia. is made by distoring sal armoniack or sea salt in Agua fortis. the reason of it explorer one of interpeter powered & mixt broather 60 grands of which heard in a sprom will make a very large as bestur. of Corsica where of is made an incombustable Noth & paper set Shil: Frans: bol go 22 Dage 911.

who Denyed that the son of God was of the same substance to Be with the Father. Ars: 46 Arianism with the Father. an : Fel. anguments of any kind lose a great deal of weight, when we in reel are Personaded he Either writes or talks only for 8.9. argument sake, & has no real Conceam in the Thing he Espouses. The Chief properties of the air are Third, grand to Elusticity. In the first place, the air is fluid, or Consists of parts of a globular figure, without any consisted 25 H ropserhus attraction or Cohesion be twist them, & which therefore a Easily glide one over an other yearing to the most slight Empression. We need no other proof of this than the case & freedom of respiration. Secondly that the as one for Instance that is very common. take two lubes of any Diameter one of his forty foot long & another of one glass four foot long both stopped at one End, fill the glass tube with Quicksilver & then Invert it, immergingen the open End of the Tube in a bason fill with the same as fluid so that the threed End may be perpendicular to the surface of the Eurek silver in the Bason. Then with the in Quick-silver in the tube run into the Bason till it commer to down to be 27 or 28 inches above the surface of the has fluid in the Bason, at which height notwithstanding the specific gravity of the quickilver, it will remain suspended in the gravity

how it is Certain nothing Can sustain the weight of moreury in the Tube but that Counterpoise on the remaining surface of the fluid which by all discooling can be no other than that of a column of air of the same Diameter goith the orifice of the Jube prefing on Every other Egnal part of the fluids in to which not being counterbalanced by any air in The Tube, raises or suspends when raised, a quanty of heenery Equal in weight to its self in order to Constitute an Equilibrium. and this appear Estain how to for if you open the closed and it will Immediately Jupport one of 600 suffer the sire preping on the mercury within Younds the tube with as much force as it does on the Jee Pases mercury without. the Experiment hold Equaly good in a Tube 40 foot long, the only differences is, that it is in thes made with Water & in the former with mercing. Thirdly the Elasticity of the air is not less demonstrable than Either its Faidity or fravity. take a little glas fall with a hale in the top; into this thrust a glas tube about half may then fastning it to the orifice of the globe with mastick to that no air can pap between, this being done fill the globe half full of water, then take it out & flow in it as hard as posible, upon which the first air will contract it self to make goom for the second, this little body of air being thus compress

& Imprisoned within the sides of the glap bat ? Shoeavours to get loose & Esopane trelf with some riolence, as to force the water above it, out at la Bre the top of the attle tubes making it to spout up in G Properties of the air have been demonstrated it will be necepary to Enquire into the fauses & Effects of these Properties. The Thirdity of the air, tike hat of all liquids, does probably proceed it from the action of some more subtile Body that e pervades & seperates the parts of the other. Thus gold & selver are put into a state of Thirdity by a the action of fire which penetrates & distolves the parts of these Bostes. to the same lause we may good ascribe the facility of water, it not being a fund Boy to of its self, but is made such by Certain Particles of her Fire or air, which Insunuating themselves between on the particles of the water, do by their activity keep It in a Constant state of fluidity & motion, & when this is in a great measure destroyed by Excepive Colo, som the Farticles of water settle unto a state of rest & war form that Consistent Body wer lath Ice. it is not absince to suppose that the air itself is a fluid only by means in of the Interposition of a very subtil active matter to between the parts of it & in which it mins this wastage matter ency be Call Other & is probably Endowed with

Eaven to the Fire itself as good as decreed that all Bodies that compose the braterial system shall have a tendancy to wards their centre, of the degree of their acceleration should be in proportion to their respectione densities & to the resistance they meet with from hose thirds they pap through from the first law if follows that a feather & a fall of lead thould descend with Equal velocities when not obstructed in their descent by the air; whereas on the air or water they will descend with different degrees of relocity according to their different dessities. Of the same law it would aken is e follow, that all the air in the atmosphere should descend upon the earth, & form one Consistant mass of matter, but that by a Consequence of the second, the other which serves as a medium to the air, & wherein it floats, prevents its descending by Communicating to it motion in Contrary directions To that the gravity of that vast Body of air that Surrounds our Earth Secomes very Inconsiderable & adapted to the Constitutions & herepities of those that freath it. Elasticity of the air results from the particular the fructure of it it is very probable that every particle Book or a pair of bellows; & Consignently the air must sevel & dilute itself in proportion as the Otherial

matter or the fire Insinuales itself be twiat the aming as it is Evacuated from between them. The heat of the sun find Easy admittance how or G vapora fin Cause all fluid Bodies, & so Insimultes itself into the flowing some sometimes of the air which gives fluidity to ce y the rase leution of the air! the water thereby rarefying the air, & Consequents Those globales of water in which it is Inclosed. Hun G. hery Sarticles being reflected back from the surface watery bubbles, into which they Insinuate hearston to gather with Corpuscles of different natures, that the happen to be mixed with them. the fire & ranfied to air ocupies the Inside of the Bubble, while the good water & the other grofs particles, which are repetioned on Every sive from the Centres go to form the shell fait or outside. These little globules thus formed being on lighter than so many Equal bulks of Comprehed t air at the Bottom of the atmosphere, must non heceparity ascend into those Legions where the tare air is of the same specific Gravity with themsee Where they remain suspended. hature Display of & Rogers When these Bubbles which are scatered up & down in ter The atmosphere meet with a Cold gir, & which has me more power to compret than the the which is in go

the fenter has to dilate them. then the particle of air which is in the Center of Each Bubble Contracts itself Causing the Buttle to do the Pause sames. how the same quantity of matter upon of fogs Condensation, taking up less room than before; Dues & small rains. Every Buttle becomes heavier than an Equal bulck of air, & therefore by the known laws of hydrostaticks must subside; Consequently, in proportion to the weight of these Bubles above that of air, they will discend with greater or les belocity in the different forms of rogs, milien, Dues, or small Rain. If these Bubbles meet in their discent with an air to Cold as to freeze them, they Condense into flates the reason of snow of different sixes; & as snow does always the from Consist of Bil, volatile salt & a particle of Fix which thut up in the Centre of this little Congented Body it must necessarily follow, that the Landon which it falls must be Enriched & Fertiliz's by it. If there we realy any air pent up in these plakes of Inow so as to Constitute a little hollow Body, whoes Crust or shell consist of Congelled water, the Conseque would be when the such comes to melt, & the Confined air which Extended its dementions to be set at aberty, the distoliced water that before anstituted out a part of it

must ocupy a much less space, than the snow did, white is a truth confirmed by Experience & Consequently an vericles by which we accounted for Evaporation. or G Great When a Forrent of Richappens to force one flowin Rain against another with a biolent shock a great parcels of the Buttles funt & dash me against unother ?. forming themselves into larger of leper drops of hater, G. according to the different force, with which this wind act upon them, Either in a perpendicular or Horizons direction; & the greater the height they fall from, the more they Coalescer by falling within the sphere the of Each others attraction, & Incorporating as they fall which is the reason that Rain is for the most part very small that descendes from those Clouds that are to & near us, whereas it falls down in large drops from those that are a great height above us. Falling Hars then From those Fiery particles lodged in the Center of non the Bubbles before mentioned, is from the different particles of oil, sulphir, hitre & other combustable matter carried up into the higher regions of the atmo -sphere, along with the varified Papour, is formed are in for flamables substances, which becomes more or les visite and according to the different strength of the Comparition Is the quantity of it if the Enantity of Firey particles you

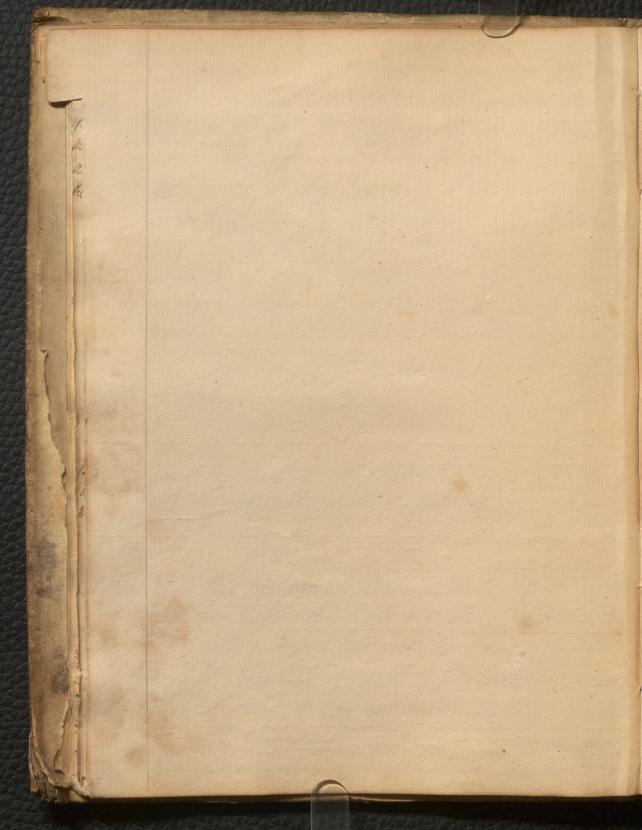
Spring from the Bubbles of water upon the Ellision of two Clouds be very Small, forming only a little globe of Fire, which shoots out into a train of fine in the air & straitway disappears, this is what the Common Jeople Call a falling star? when the flash is projected through a large Extent of air, er sets fire to a train of the Inflamable matter which happens to be within the sphere of its attraction, it is what we Gall Lightning. Thunder when the Eightning descends in great flashes like an impetuous forrent, it is what we call a Thunderbott I this has different effects according to the disportion The air, is he different force & proportion of those Ingredients which Enter into the Composition of the Lightning. Thunder The air which gets loose from those broken Bubles in which it was before Imprisoned, & that which happens to be pent in between the Courts, is necessar very much dilated, by these Inflamable substances & therefore being hemmid in on Every side by thick clows which Contrary winds heaping togather round it, orly the falling in of one Cloud upon another does by its cap cansive force burst its papage, through them with a Violent Eseplosion & Causes that Crack or rumbling wer Call Thunder he dap seems Continue or reiterated by reason of the sound being reflected from the surfaces of different Clouds which cause

Battalion a body of Foot Soldiers Consisting of 6.7- or 800 men Brafo is a sort of Copper, mixed with lapsis file Be minaris, according to Job 28.2 Brap is mother or G of the stone; that is by the heat of subtenaneun fires the stone is transmuted into the substance of Brap: it is dug out of mines on hills Dest & I as the specific gravity of Hood is legto than hus of Water & as the Freight & the air which are in the Barge togather with the Timber it is made of, do all formes a body of less weight than the Boat Column of Water whose place it fills, therefore the the reason of its cam Barge does not subside. suppose a Barge 120 a burden foot long, & 18 broad, now no multiplied by 18 give 1800 feet, if we suppose the Barge to draw two foot water the sum total will amount to twice 1800, or 3600 fat whether of Water or freight; for we now Consider on as filling an Equal spaces with the other, so that upon the whole, the presure of the Barge upon the River is no greater than the prepure of there Body of water whose place it supplies. suppose a Entick foot of water is Equal in weight to To pound if therefore we multiply 3600 autick feet of water a (the demension of the Column of Water whose place is occupied by the barger by to the sum given wilker 252000, which is the humber of pounds that that Bod go

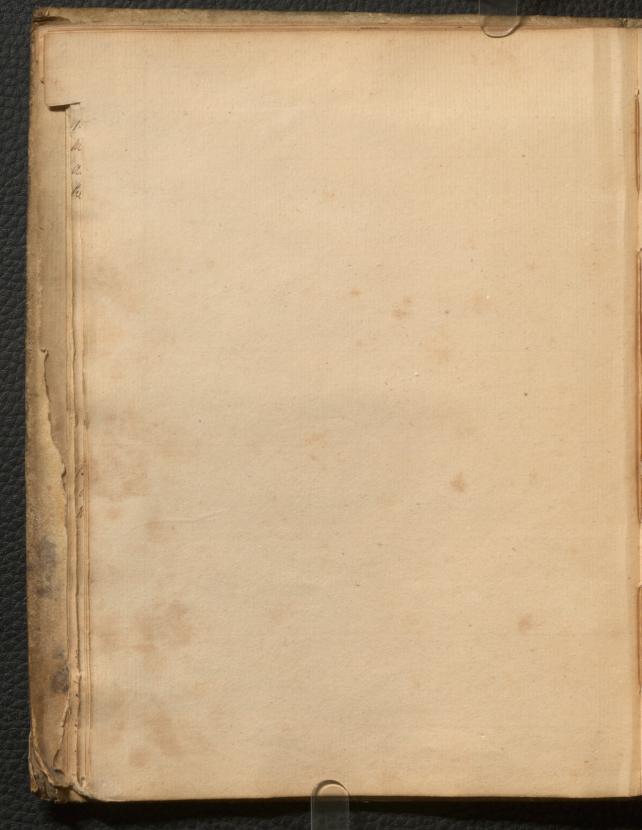
of Water weight, & Consequently the weight of the whole Barge & its Burden taken together. Breadto Put into the Dough a nutstiel fill with live sulphur make it Tall petre & Luicksilver & stopped Clove; as soon as dance in he den. the hear comes to it the Brew will dance in the oven. Thus by means of Enicksilver put into a pot where Seare were to be Boiled all the Seare will leapout of the pot as soon as the water begins to heat, in Tiko manner Zuicksilver pur into hot Bread with make it dance up & down the Table for it an bear no hear without being in a Continual motion. Boil, over a gentle Fire, In Common water, Kogs Bum lard, Thimming it perpenally till no further scum ment for anies; then expose it thus melter to look in the clear then air three or four nights. after this melt it agam in an Earthen repel over a slow fire x straw it through a linnen Cloth wito Cold water & after wash it well in fair river or fountain water to take away it salt, which will make it become white as snow. Then put it in a Glazd Earthen refeel for use .- Ozmans math: recreations.

a natural production Callo Kusma, weed in the Beard a maste East mixed with quick times into a paster will take to take it it off Entirely but yet so that it will grow again, G off. but not quite so fast Do shaws a Bridge of Boyle 9 137 Birds why white in northern Countries in the winter & notin Summer see Birds Jago yo 17 End of this Book. the Cause of the Consistence & Cherence of the part of which they are Composed. The most soft of Bodies are replete with saline & Sitriotic particles such as mely in some means Contint to their Coasulation & Consolidation, get the primary of haturally Indivisible Corpuscles of which the hartie of all Fories are composed, are not connected by salt or hooked atoms, as some Imagine; nor aleved together by rest, nor Mich togather by Conspining motions but rather Chere & are whited to mutual attraction. To that the smallest particles of matter may there to the Arongest attractions, & Compose Rager particles of weaker birtue; & many of these may there & Compose Figuer particles whose Eirho is this Exertise. Hehoe particles of Bodies which touch one rando in Large superficies Enthony & hutual attraction of their parts, composed a Boon very hard; & if these particles are not so Hongly affracted or Entangled with Each other. the Body will be britte; if they truck one another in Els

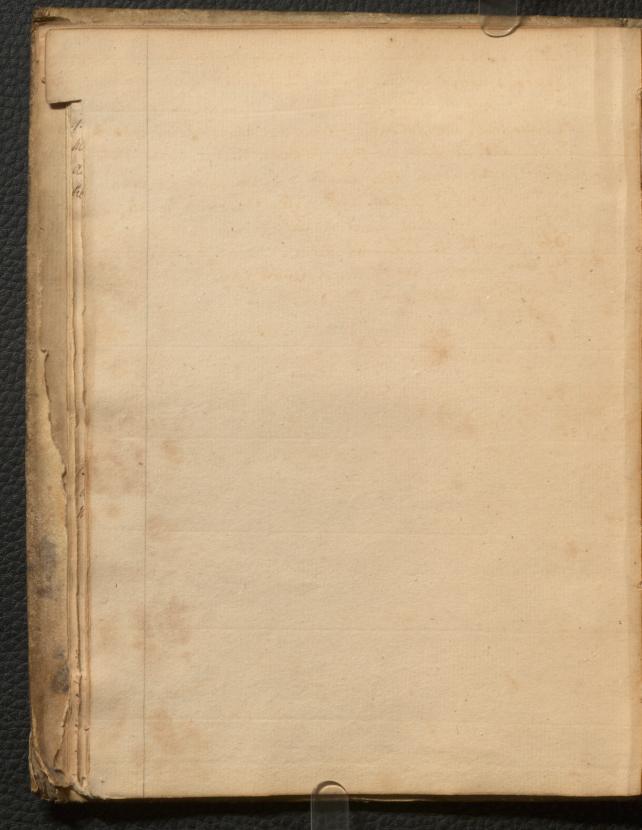
in les superficies the body is not to hard but met may be more toto, if they only approach Each other Without Thisping one under another, the Bog is Elastech & yorkness to the former France; if they slip under Each other the from istroff, 85 Eastly weeks to he stroke of the hammer; if they scarces touch Each other the Fody is Erumbling for such whose parts may for Easily Seperated; if They are mall round, Shippery, & Easily agitated by heat, the Food is fluid; If the particles are of an un Equal superficies, & hooked or Entangled one with another hen is the Fordy flexiles or pliant verenius, Geograps: 995th note out of the Beryloth & 9: 5 %. Birds & Beast the Cause of their whiteres 948. Beetles v 9: 26. Boat fly V. 9.59. Bolongo that this Thospherous thines by its own light, that it None does not sentite the light to which it is exposed & so Thine with a borrows aght may be proved from Exporing It to the light only of one of the homogenal Colours which totour as it does not Imbibe his very plain that the light only agitates its parts, & bores its spandor



COLUMNICATION OF THE PROPERTY OF THE PROPERTY



CONFIGHER SON



· Colo of it approaches hear the Earth, presently precipitates the vapours, either in denes; or if the vapours more coprously afrend & soon meet the Cold, they are then Condenced into misting; G if thebeapours are not only lopious, but also as heavy as our lower ait, in this case they be come binble, norm buta little hight above the earth of make what we calla it must or fog. but if they are a degre lighter, so as to mount ! higher but not any great height, as also meet not with Cold enough to converge them, or wind to dispate them! they then form a heavy thick darke Sky. Ter: Th: 20 a Cohert Consisted of BBB foot & 66 horse. The feason that Comes appear with Blizing tails of no other Planet or star does the like same Comets to be owing to some Deculiar unchous matter in the Bodies of the Commets, which by their approach to the suns Body is prodigiously heat ran fied, is made to fly off in a fiery vapour, m that side opposite to the sun. Colours are distinguished in the rays of light by mean of the different digrees of its regiongitality; for there Rays which are that refrancible, are finchired with red & paint that Colour on Bodies; & those which are most refrangible; are violet purple, & paint bodies there with; & the Intermediate degrees of refrangible rays are dyed with the Intermediate Colours in this order a orange, 3 yellow, 4 green steen 6 Indige. which may be proved by the following Experiment. In a Room made

dark, make an oblong hole in the window shuther at I about to of an Inch in weeth through which & will Enter the Sunbeam I'M & a large Thism of BG placed about 20 feet from the Hole, will refract the Rays of this Beam; afterwhich they will again with & become a white Beam at H where let be applied an opake Body 9909 at the distances of 2 or three feet from the Frism in which let there be an dang hole made at & 40 or 50 of an Inch in Breaith through which the white part of the beam being transmitte is made to fall on a Tiece of white paper, willhere paint the primitive original Colours of light suppose Red at & yellow at I, green at it, Blue at q, & violetatp. then with a piece of Wier & you may by Intercepting the Rays k, l, m, ii, o take away any of the Colours at t, s, P, gor p, whils the other colours remain as before from hence we learn that the Rays of light paint hatural Bodies with different Colours, that the least refrangible ray's at t paint Red; & the most Refrangilleones atp paint the deepest Sumple violet, & the other fatimed refrangible Rays the other Intermediate Edoux: Mindy that those deferences of Colours are absolutely & really ocusting on the rays of fight & do not arise from the langing of the down, variously my thing by the light as formerly supposed.

oritioism great men are the propper objects of friticism, lest the faults, they commit, should serve as a Rule to Inférior writers. Colours. From the following Experiment may be proved that Colours are not Inherest qualities following from substantial formes of the G. Bodies where unto they are faid to belong, in H by a bare mechanical Change of reschie In the minute parts of Bodies Corne may in a knoment ber generated des novo & again M Wherly destroyed. The Experiment is thus perform take good Common sublimates & Tahate it with what quantity of Water you please, are July filtre the Tolusion through clean closes paper that it may drop down clear as fountain water, to aspoon full of this drops in 3014 drops of oyl of Tartar per dilignium well filtred & First change it into a deep brange tolour, into which if you do feet drop 3 or 4 forthefulls of Oge of bitriol twell Entirely about the Colour. D' Manis abridge of his popler north 82.

there is a way of producing a purple by Colours Infusing the powder of togwood for a while in fair watervafter it is sufficiently red, by dropping there in a little sal armoniac the Cobour will be Immediately Changed into a lovely purple or shaw Boid: of Boyle. Colours in the Object are nothing but a disposi Colours Prace of the pasts thereof to reflect this or that newtons Fort of Rays moher Coprously than the rest. of them. The minutes Corpuseles that Compose lique? may Easely Institute themselves into those pores of Bodies whereto their some to figure wast Them & these pores they may Exactly or in as equately fell, in which latter case they with for the most part after the number & Figure, but always the Ingnitude of the former pores Is in what Capacity to Ever these Corpuscles of liquor come to be lodged in the pores the surface of the Body will commonly have its aspening aftered & the Incident light that heets with a grover liquor when little avities than before

will have or rays refracted, absorbed or reflected 13 more or less Integularly than in its former state? thus we see that even fair water falling upon white paper, annew &c will renderit for these reasons dup D than the unmoistned parts of the same Bodies. Thus if a drop of byl be let fall upon white paper that I part of the paper will appear much darker than the rest for by this means inany of the incident rays of light bained haven transmitted, that would otherwise be reflected to the Eyes. 9:16 Shows abri: of Boyles works. 801:2 The divenity of Comlours often signifies ansiderable down alterations in the dispositions of their part, the the different Colours of the same First & Flowers keys Thilosoph from affirming that a diversity of tolours always dendes some great difference in Bodies. Instances of this are obvious in several sorts of Fruit, wherein according as the begetable sap is ripined, by paping from one degra of maturation to another the External part of the mit Changes from one Colour to another. Tempering of steel affords himother Instance of this kind . First the Steel is harden by heating it in glowing Coals, & not quenched as soon as taken from the Fire, but held over a bason of water his it descend from a white heat to a red one; gohen tis Immediately quenched in Gold no after the steel thus

hardned will if good look whitein, & being brighten at the End is held in the flames of a landes that the bright End may tie about half an Inch distant from the Hame, it will swiftly pap from one Colour to another, as from a bright yellow to a deep & reddish yellow, from that to a fainhor fint & then to a deeper Blue; Each of which suclan Colours argues such a Change made in the mixtin of the steel, that if it be taken from the flame & Smineo ately grenches in Sallow, whilst it is yellow it will be of such a hardness as w fifty drills & graves, if hill it him blue it becomes much tofter & propper to make springs for westches, which are therefore Commonly of that island It if kept that longer it will grow he roft Eaven for penkusves. Thans abrid: of m Boyles works. role 92? Colours to Change one body into more of different Colours ent from into which being ponto half the quantity of the othered solution of minium in spent of anagor the liquor Equor his be hirrer into a fine purple, buto which drop as much spirit of sal armoniac as well precipite about half the lead & mineviately thining them

well to gather they will full dow partly in the former powber partly in that of a Euroled substance that will retain a blewith purple Colour, upon which Instantly powring a pretty quantity of spirit D of falt the matter first progritatio was by E the Conscal figure of the glass preserved, from I the spirituous salt which Fuedenly precipitated G. upon it a new bed of white provoer or the remain ing Corpuscles of the lead that the uninous spirit had not smick down. To that there appears in the gluft three distinct & very differently Colour substances a purple or biolet lotource precipitate at the Bottom, a white & Carnation precipitate over that & at the top of all a transparent tigue of a lovely gellow of tee I thans abrid of the Boyles how was That the Colours of Bodies greatly depend upon the Bulk to figure of their superficial particles, seems probable, tince many ancient & modern Thilosophers have thought, that all Colours might be accounted for from them alone. a liquor may altre the Colour of a Body by Committee the parts, Either by disjoyning those Clusters of parties which thick more closely togather only by means of

Some Cement Easily disolvable, is this seems to be the Case in some of these forementioned Experiments where the Colour of many Corpuseles brought to where by being precipitated togather is destroyed by the efusion of very sharp & piercing liquors. or by dividing the groter parts into minute ones which will be for the most part otherwise thaped than the Entire Copied make a Fincture of red Rose leaves with a little oyl of vitriol is a large quantity of fair water power this off into clean water till the waterheld against the light require a Competent redness into This drop leasurely a little spirit of nine or thaking the glass by holding it up to the light you will see the red tiquer Immediately turned into a fine greenish Blue. if upon the falling of Each drop of spirit of vine you shake the glass you may observe a pretty variety of Colours on The passage of that Tinetures from a red to a blue. Crystall See the End of the Book 9:6th arbor Diana et martis. County this Fish according to the Observation of hi De Reaumur has

Concave by degree. He becomes Concave before we can perceivert, & The very moment it resumes its convexity we are struck. The Quicknep of the Blow benums the hand & arm by subthy stopping the course of the animal spirits by a Contrary Imprepion. Talis Phy and To found by Experience that Says are Composed of parts Mours 7 Two hewholy very Heterogehous or dipimular to Each other. for a hay of light feing received on a refracting surface in a Dark G Theory of them place is not wholy refracted to one point but plit asit were & defused into several little Rays some as in the figure in the margine are repracted to Lother to the Suter mediate Frint between L&G ie how particles of light which are the most minute are of all other the most N Easily & most Considerably diverted, by the action of the reflacting surface, out of their sectilinear Course toward I to he rest at each Execces another in Magnitude, son it with more dificulty & left Considerally hirned out ofin right lined course to the Points between 18 9. Each Ray as it differes as it differ from another in its Degree of Reparatibility to does the differ from it in Colour Mis is warranted by humerous Experiments. Those particles which are most refracted ate found to Constitute a Ray of a riolet Colour is in all probability, the most minute particles of light, thus seperatly Initietto, Excite the shorts Sitration in the Retina. again those Particles which are the least reflected Constitutes a Radiolus or Ray of a red Colour is the largest particles of light excite the largest particles of light excite the largest bibrations so asto Excite the segration of the Colour.

The other Particles being in like manner reperated, according Colours Mack to their respective magnitudes Excite the Intermediates newtons theory of them ! Entrations on thus occasion the sensation of different Colour. much in the same manner ous the several Di brations of the air, according to their respectives magnitudes, Excito the tensations of different sounds. Garther the Colours ofthen little Rays not being any adventitions modifications thereof but Comate primitive & hecepary poperties, as Consisting, in all probability, in the magnitudes of their parts must to perpetual & Immutable is not to be ahanged by any refraction or lefliction or modefication whatoever as has been proved by numberly Experiments. The transmutations of Colours, by miseing those of different kinds are fut mere deceptions of the right for the Blue when viewed with a microscope the Blue & gellow particles appear distinct. White is the Erdinary Colour of light which is nothing but a confused afternotage of all places The Reason this Exhibits the Colours of the Rain fow is that the differently Coloured Rays are seperated by refraction. Those Lays which Exhibit Gellow are farned Farther from the Rectilinear Course, than those which Exhibit red, those which Exhibit green than those which Exhibit Gellow, but of all others those which Exhibit biolet the most accordingly The Firm thro' which the light is transmitted, be turned about hern over to K where his goes on. green the Rays he projected in this

how made see Colours. Drills The Particles of water by their agitation drive & Expel as by water from the Intentices or Jores of different salts the air They penetrate them as somany small wedges D divide break & dipipate the parts. The same is quantity of water only desolves a certain Quantity ! of Common sally recause the points of the water G. being flunter by striking against the parts of this salt, find no more accept into its pores. The same water does not get lease to dipolo a determinate quantity of Jugar. The reason is the particles of Water are still fine Enough to Enter into the larger pores of sugar but as they are blunted more se more they become two thick for penetrating into sugar. Arounes have no water or at least very little in their langito enons That the Cause of their death must be owing to the more of the Blood & and for as the Blood forments in the heart lit must therefore for Continually Cooled again, othermuse the Excepive dilatation would break the repell & the? Extravarated flood ceasing to arculate would also ceak to Cam life into the reveral part of the body. The Blomp of the air which we treath temperates the heat & to breserves life. besides if the air did not insinuate into the Tobes of the lungs they would be contained by their spring in a state of Contraction. Their reserces would not be

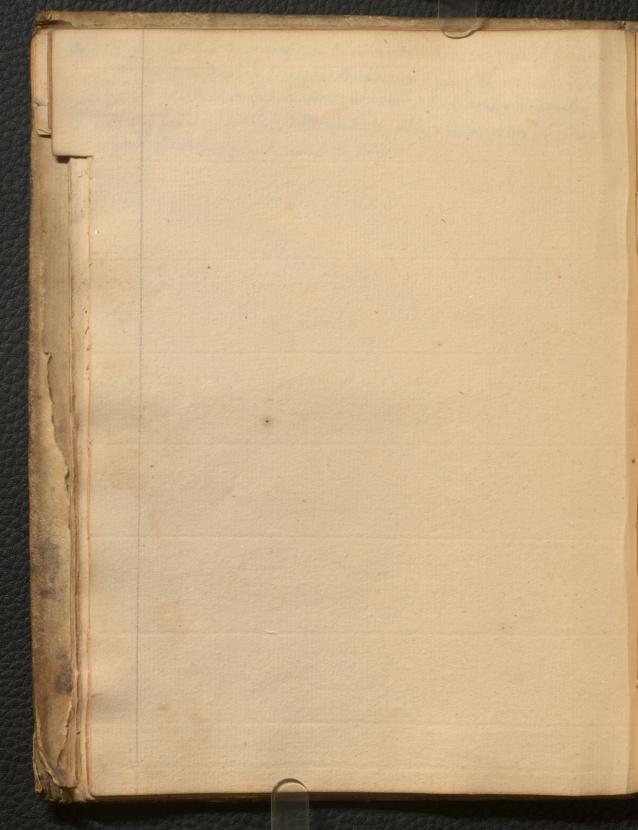
sufficiently Extended. The External air being not able to Circulate would oppose their dilatation; the Blood would not find free papage Enough in the laberinths of the Lungs, the Girculation Fronts be interrupt 8 the up finish with it - Dales Thy: vol2 9 196.

Death watch what: v. 9:63.

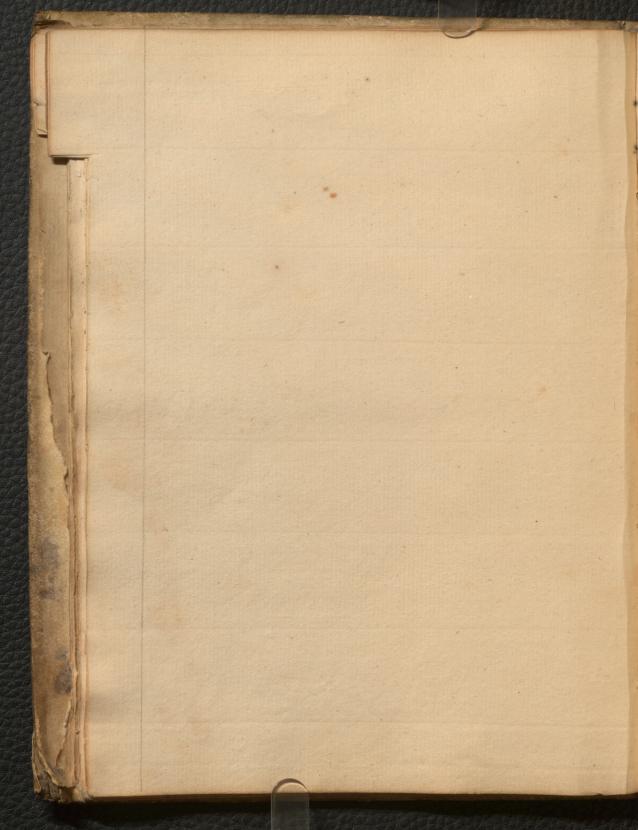
TOTAL STATE TOTAL

Acids seem to be composed of such Clementary Particles as are Endned with very great attractive Fower, whence by Insinuating Kemselves into of pores of Bodies & attracting of Particles more trongly than these Particles attract one conother, you thereby reperties of divide them. Probably of Figures of y Sarticles of acros, may be like wedges to facilitate y Entry into Bodies, & to Seperate of Particles. Chency's Philosophicas Theory 9.102.

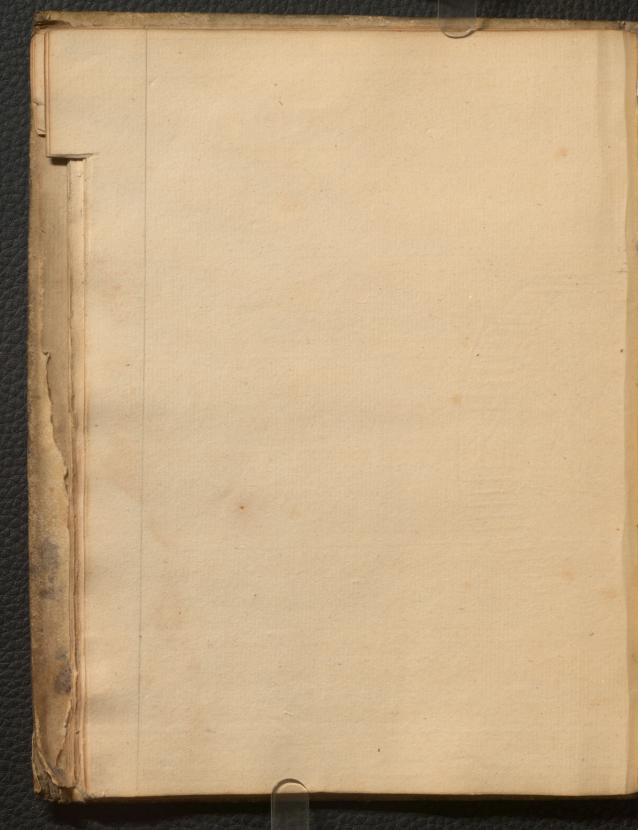
EFIGHERIZIONS -



EFIGHERIZIONS TO THE PERSON OF THE PERSON OF



EF GELKINOP



Enamel The general opinion that the art of painting upon glass is lost, is without foundation, seeing that of Enamelling is still in use, which is the same at with the other, but only in ministure: glass, Tenter & Lead, with Certain Contoured Earths one the matter of Emnamel, & which will stick to metals for a long Continuance of Time. The Coulours are mixed over the fire of a lamp, which is made hot Enough to melt them; the artist first draws out his coulour into fine threads or strings like those that proceed from a stick of melling sealing wase, & these he draws to what leargh N he pleases; having made this provision, if he has any Divices to Enamel, he melts at his lamp the Extremities of such threads as he has occasion to use & Immediately apply it to that part of the Figure he is upon, & hus with much patience as well as deaterity he penues his Work not Dus ?? Tarth offections The most reasonable objections againsthe Earths is its motion auswered. motion are these Fix That If the earth be moved from W. to & a Buket that west ward would have a further range? han One that Eastward; or if thaty

Nort it would mis the mark; or if Sementical upright, it would drop to the Westward of the fun. that a weight dropped from the top of a Tower woods not fall at the Foot of the Tower 21 we see it doth with boubling the laws of motion, the miles of mechanicks or mathematicks the following will be a sufficient answer. Let any one thut himself up in the Cabo of a Thip, & let him hang a bothle of water up so as to Empty it self drop by drop into another bothe with a narrow neck let him also have a parcel of grat & other little wing co Insects. while the ship hies still diligently observes how those voinged Insects fly with the like swiftness to any part of the latin Is how the descending drops all fall into the Bottle underneath, is if you leap you will reach as far one way as another. having observed her particulars whilst the ship his still, make the Ship to sail with what velocitie you please to so long as the motion is uniform is not fluctuating this way as that you should not perceive their is any alteration

in the aforesand Effects, neither from them Canifor Con clades whether the ship moveth or franceth sill. so that there shall not be the East drop of the water on the Floor though the thip shall have run many Feet whilst the drop was in the air. he cause of which Gorres some ence of the Effect, is that the this I Instion is Cometon to all things Contained in G it to to the air also when thut up in the Eatin. Durham's astro Theology. I's of the prelimenary discourse. We may represent the four Elements in their order in a long rial of glass or Crystal as AB price to represent the earth make use of Blak small water Coarsly pounded or flue small well refined or Black Course antimony. To represent water power upon the last the knowing Justances of the spirit of gartar, or the Clear solution of Pot ashed with a little Roch Azur which will give a sea Colour. To represent the air pour upon this Composition spirit of wine rectified stimes. or Else the most spirit ous trandy with a little Jumsol, which will niver s a Celestial the or air Colour? To represent Fire poor upon all three the bil of thehing which by its tolour lightness & subtely, will make a prolyner

Coments

Electricity see amber at End of the Book Page ye's. Earth that of Tatna in mogul Eatable see repel Jage go 1" Echo? the reason they repeat more in the night than Day is because in the silence of the hight the air being more calm or less agitated with diven motions Convays to us more Easily & from a greater distance the Impressions which it receives. Tales Thy: vol 2 Page Eggs being once formed, are hatched by a certain how degree of heat which agitates the liquid maker, Which Encloses the Embryo; the heat divides this matter, attenuates disgests, or makes it flow through the havel into the Body of the little animal. The repels which receive it succepively, obrect it towards different parts of the Body inorder to Convay nourish accretion & life. In Egypt they hatch Eggs in Ovens for a particular account of which see Dales Phy sols 9. 704 These happen most frequently where here a the man quantity of suphur, here mines must sond up Exhalar which necting with subterraneous Enverns, they must thick to the tops or arches of them as not to Rivereys, where they mise themselves with the ralt peter which omes out of the arches as we see it out of the Wrider of the arches of ord bridges, this miching, provos

Thould a mischer of vapours & Especially Exhalations Elevated by the hear of the Day happen to Good again, n meteors to Condensate, & at last to fall clown by its propper weight after sun set, this is the clamp. mist are thick folloctions of groser rapours & Exhalations m mist which their weight, or the low that Condenses them hinders from tising much above the surface of the Earth, the Told which unites the vapour & G. Exchalations, renders the mist perceptable, as it makes the Breath & sweat of Horse's perceptable in. Fronter by reuniting the particles, which the heat of tummer dipipates. are the mists charged with hitrous or sulphurous particles, capable of Rearing the Fibers of Plants Ears of Corn, or render Fruit, if these Commuscles milen. happen to fall in mall Rain, it is mildew. This attached to Hant; the Frints of its nitorous & sulphuras it a men take a hem & going Corporateles sink into to disorder the Riber to Kindertho Inotion of the frices; the plants & East of Corn are well from the dried up & Fade away for want of hourshment. peaked before When the rays of the sun pierce the mist, the heat in y com banks rarefies it, the rarefaction renders it lighter being var hil hogelighter it is Elevated in a Cloud, or dissipated, sometime in and danger. The lighter parts being reperated from the groper fythe Heat are lost in the atmosphere while the grother parts fall down again upon one another is by being brites.

Composes a species of long thread, which floats at the pleasure of the air & to which they give the agreeable name of the Hair of benus. this mixture forms a hartural kind of gunpowder which may to Easily set on the by Ether the Jufan Freath of the Syntes, which is a kind of haharay takes fire, or by the fall of a flint or stone or Ty the Fermentation of Janours, hence we acom for Earth quakes to the staces where these dicharge hunselves are lato bollanos. Derenius Geogra: volito its form which was formerly thought to Fer truly spherical is now found to Smithe Father an Oval Egure, or that of an Elisis revolved found its liber axis: to that the dian ever are longest which come nearest the Equator, of Elen as they become more remote. The French made an Experiment about 40 years ago, thewing that the Tendulum Eibrakes to much the slower, by howmach the hear it is brought to the Equator? that is the gravity or Celerity of descent of the Fendulum & all other socies is less in Countries approaching he Equator han in placed neaver Either Sole. Kin demiration of height . That hew demonstrates to naturals arise from he retation of the Calls round its axis: which what Bodies from the axis of motion: to that this motion being

Initer who er he equator, than in parts more remote; the weight of Bodies minst also be much less there than neaver the Polls. Therefore the parts of the Scenn under the Eductor feing thetier & according to the hature of all fluids prefer & Fred on Either Five by the waters neaver the Toles, they must be raised up to a greater height, that is they hay better support & balance the greater weight of his G. by the Eands adjacent, which are Every where raised H to the whole terragueous globe. The same Inequality of diameter & Found in the Planet Suriter by Hamsteads. that much more than in our Earth, which stainly proves that the difference arises from the arcular motion since The diumal rotation of that Planet is more than twice as swift as that of our Earth form Gen. 928.
The Earth is spherical form because a there; is not so Leaf 23": "Franch ... reper insent about 40 years alo". userall Protots from Beanard Varenius (M.A.), "I eogosphia generalis" X Mre ? Ave (aust. 1650, Caul. 1672, '81, 1712), Shaw's Eng. tol. 1734. Was o divino this refer to Jean Richer's observation, in Cayenne in 1672, on the retardation of the pendulum near the equator? Machin The French expeditions to Peru and Lapland were not the all sent till 1735 & 6. (y. Danneman, us. 5789, ii, pp. 270 and 386.) Much ham of cone is the hatural cause of the sphericity of the carte veren: Geogn 938.

Composes a species of long thread, which floats at the pleasure of the air & to which they give the agreeable name of the Hair of benus. Dals Bry: vol. 3 ? 96. this mixture forms a furtural kind of gunpowder which may to Easily Jet on Fire by Either the follow Freath of the Syntes, which is a kine of hamisthat takes fire, of by the fall of a flint or stone or Ty the Fermentation of Pasour, hence we acon for Earth quakes to the staces where these discharge hemselves are lato bellanos. Vereninis Geogra: orling its form which was formerly thought to the truly spherical is now found to Smithe Father an Pool Egure, or that Form. of an Elistic revolved found its liper axis: to that the dian ever are longest which come nearest the Equator, of Elen at they become more remote. The French grade Gendur it is on of dela alik toa demira arise from the traken of the Carla round its according to the two of Excular motion, to Bodies from the axis of motion: to that this).

In ther wowder he conator, than in parts more remote? The meint of Bodies ninst also be much les there than nearor the Polls. Therefore the parts of the Prean under the En feing think is according to the hature of all faid Freed on Ether Fire the the waters neaver the John, they must be raised up to a greater height that is they may Fether rusport & balance the breaker weight offer Gontimous waters. The Foure of the year Fing resemble? By the Fands adjacent which are Every where raised above the rea the aforesaid form must be attributed to the whole terragueous globe. The samo Requality of diameter is fand in the Planet Supiter to Ham Fears that much more than in our Earth, which stainly pro that the difference arises from the arcular motion since The diumal rotation of that Planet is more than twice as swift as that of our Earth. Foron: Ges. 928.
The Earth is spherical form because a shere; is not so hable to decay & bracher as any other secante all the parts are Equedistant from the Centre x wes tolot by Mine kewtons Principles that the divine Geind at the Beation Estowed the sover of all bon of he matter of the thireso where Pories, & all the parts of Bodies, mutually affree hemselves & the another, which as Done is the natural Causes of the sphericity of the rath veren: Geogr. 938.

Ear wig V954th The Elasticity of toll Bodies is if Effect of if attracting force of y Sarticles Elasticity for when y small Contiguous is Cohering Patricles of a Body, are by a stroke or any External rolence reperated from Each other to Extreemly small elistances if this force is taken off, if seperated Farticles will by y force of attraction, this back into yr Contacts with force is y Body will recover its former figure. but if i parts are so far seperated as to be without y spheres of attraction you will remain disunited, my body will be uncapable of recovering its former state. What is y form of Elastic Allards is no matter for you fluidity does not arise from you figure but y repulsive force of your Satisfies. The figures of go Clements of all un elastic of Incomprehible Fluids, must necessarily be spherical, or approaching thereto; for were they of any other figure y surface would touch in more Elastic Balies Toints yn one of Consequently ya would Cohered. The Elemensts therefore of sold Bidies may be of your of some one or other of gregular solids, as lubes, Friengles, Friendle to your y surfaces coming in Contact you may attract Each other with y greater Force. Change Willoopliat Theory Solids Elements The Elements or least & Last Frinciples of mather are supported to be of various hael or fint densities & Figures. Those of g first order or g least, are supposed to be almost Infinitely Inneiples small, hard, & Elastic, pervaing all sodies but pervious to none, such as are paperse of Things to be getheral or herotorian Third. y Particles of 2° order as supposed to be Composed of these, & Consequently are larger, but lefs dense of Elastic, being persons to Particles of of first order, & themselvas pervading all others: of yo kind are probably of Particles of hight of Particles of y 3 order are Supposed to be composed of these of y 2 order having Such proportion to them in size, density of Elasticity as ye do to those of first cheworgs. Solid methor It is beyond all doubt set of grantity of tolid mather in anything cannot be great supposed but make of garticles of mather to be cubes se to be united by you to neach of youngles as to make culical Inherstructure. appears ble then of tracuity would be Equal to of Folidity of since mather is divisible ad Infinitume of racuity may be increased to any proportion of majority. we actually find ut water & mercury will pass through y Tores of gold & Misaac hewton has demonstrated, must have many times more fores an Tolid party set it is go heaviest of all Bodies.

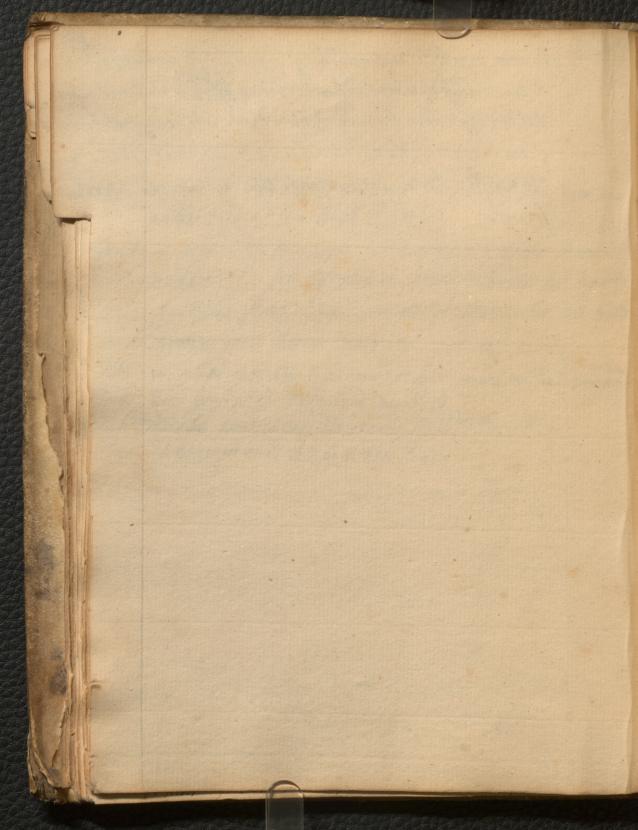
Light Papes through all ses when made sufficiently thin from all which it appears, how small a proportion there is between it solidity to bacuities in our system. Cheney Thilosophical Theory I. 93.

- to that their parts in mixing run towards one Termentation another with an accellerated motion, & Clash with the greatest force.

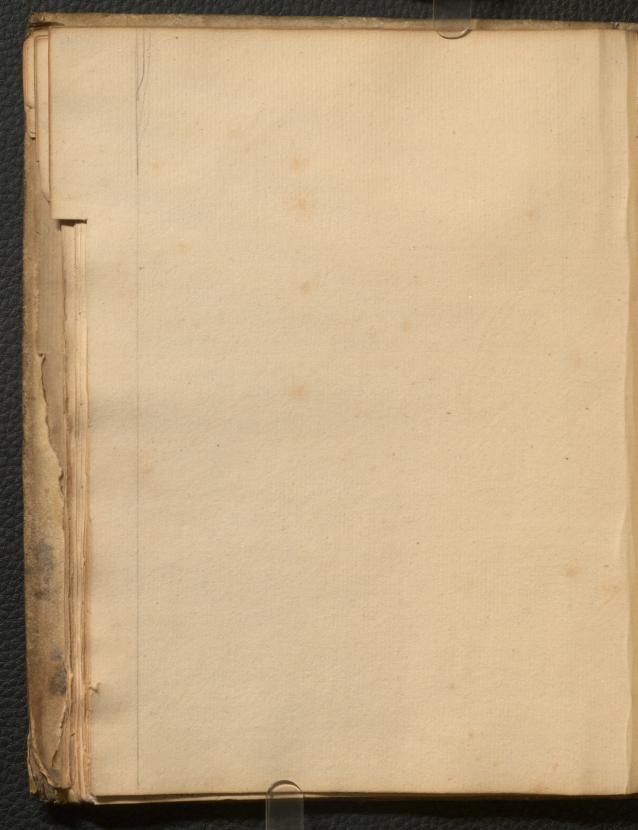
Tattery. men are like Children, that are Froward & obstinate when rough means are used or unwilling to part with the Hest play thing; but a little Flattery loosens their hold & draws from them their most valuable Popelions. Fontinelle giolo: etugst: & Britis false Fame People total think to make them selves admired by actions for which their names become a laughter, maybe said to pay the price, & loose the Purchase. Centrifugal is that whereby a body Revolving round Force a Center Endeavours to recede from it. Centripetal Force is that Fower where by a moveable Body impelled in a Right line, is drawn out of its Recti = liniar motion, to Procede in a Curve. the Roman measured from an autique of 2 Pontefacts. Jathom. the Hebren fathom, somewhat more than I feet & 3 inches. The opporte of the greeks, Herodotus recons, the same as out. Frost & Cheyne Imagines to proceed from a saline such Trost. floating in the air whose particles are very sharp & pointed, these Insunuate themselves, in the form of a wedge into the pores of the particles of water xall other humid substances so as to fix & Chrystalize their superficies. rermenta if 2 pasts of spirit of hites poured upon one of tion 'out of Curroway seeds, of Oyl of Turpenhere thiknee with a little Balsom of sulphur will grow so very hot as presently to send up a turning flame. doesnot this argue that the two honors mix with violence

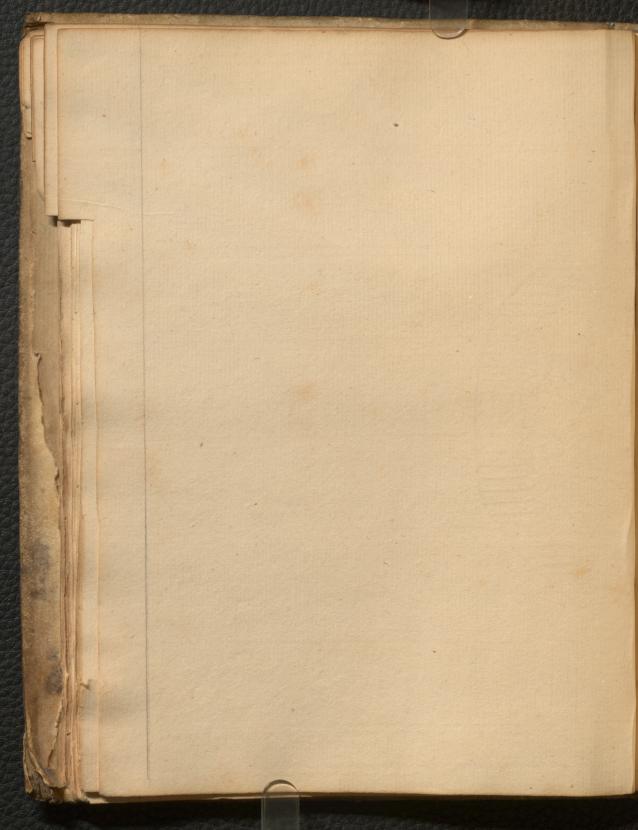
a way to handle it without being burht see Onion here at the ind of the book 9. 403. Druit is ripned by the heats aftenuating to a certain degree, Whatsoever is too agreeous in Fruit, & render the Imperior particles finer & more propper for thinking the task with Shoot an in laid one how to preserver it from worms, see Sant hands preserved the from worms, see Sant hands preserved the from worms, see Sant hands preserved the start that the 939 to 943.

This Ich neumon ones 9: 26. & there 9: 61. Palts It seem in possible to determine of figures of particular salts of same acid disolving different bodies asumes different shapes ept of nitre after disciona Copper, thooks into heaugonal crystals of same after disolving from thooks into irregular equares & again after elisolving vilver formes this Crystals of a triangular Figure.

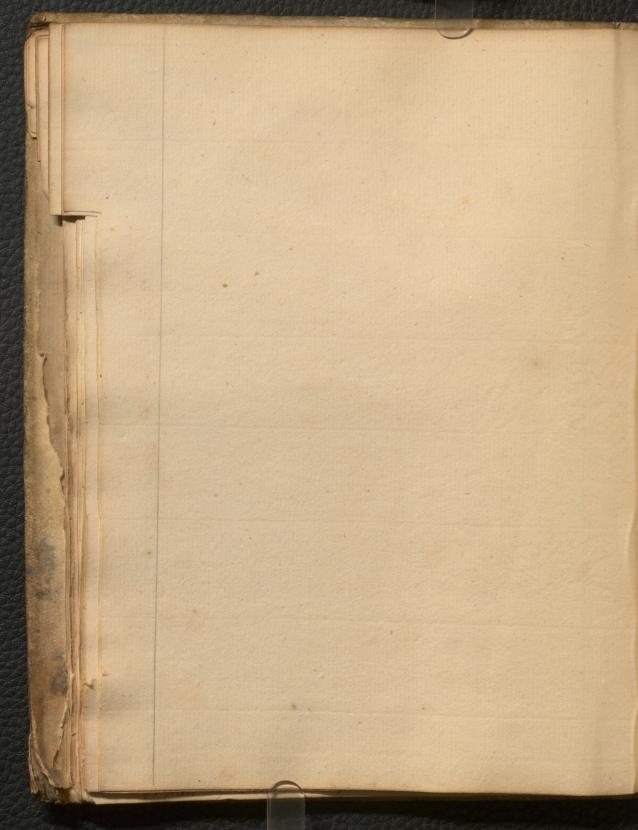


GH-KIKI KIOPICA - X





GH-KLK ZIOPIC



The drop being let fall red hot into wall water glass the External surface hardens into a Coust whilst Drops. the nive still popelses the Puside of the Drops, while getting loose leaves a hollow or void place within the Crust how the reason of the Drop's not being broke by the External prepure of the air, is him of the rotundity of its figure, which forming a Convex or arched round he vacant space, supports Itself ander the weight ofthe Incumbent air, by resisting it Equally on Every part: whereas by breaking off the heck of the drop you make a flat surface for the air to 1 act upon, which meeting with no resistance from within, to Counterbalance it prepure, it Crush, It to Fieces. ooking a layer of Enick silver & a leaf of Jewter Gluffes applied to the plaine surface of a glap, will on made Exactly reflect all the Rays that full upon it, the white leaf which reflects them is Inviville at the same time that all the objects from which those hays are emitted are clearly discerned. Mus does this smooth Plain become a Sichure far Exclesion the most Timished Ricces of Raphael & Rubens.

hor does it like them, Exhibit only the one & the same hepresentation but several suco esively: when a grand Company is in the Room, it represents you with a magnificent then of different groupes of figures: If you open a hindow to the fields, it streight dis = plays a beautiful Landskip; or if it reflicts but one single Figure, it is drawn to the life without flattery or Disguise. Told the The proportion which the weight of gold bears tetwisot to that of silver is as Eleven to Tiventy, that is to say, if a Cubick map of silver weighs clave ounces; a arbick map of gold of the same dina Sions will weight twenty ounces. The proportion betwiset the value of these two metals is nearly as one to Fourteen, so that If a ounce of silver is worth 7 shillings an ounce of goth will be worth fourteen times as much. a god- seater melts three ounces of fine god, & heats Bearing it on his anvil who a plate as thin as Paper; he out it with his theer into pieces about one such I quan which he put between the leaves of a kind of square Book, which he wraps up Clac in a double Farchment

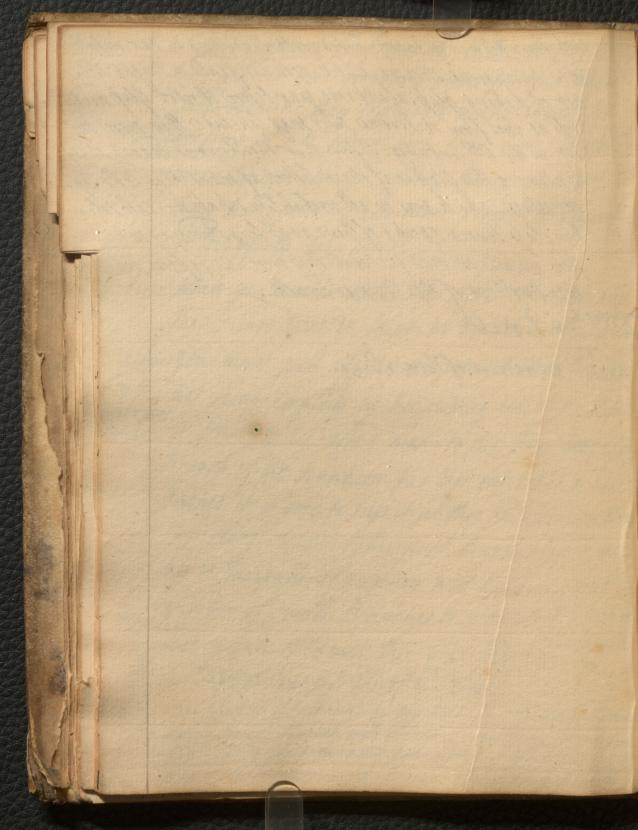
fover he then with a great hammer beat he Book upon a marble block till the leaves of gold are that out nearly to the size of the Book; he then takes them out, but them in four, & places them again between leaves of parchment, repeating the Busines of Rammering & authing several times. after they are Brought to a fertain degree of finemes in the two first books, they are made to undergo the Same discipline in two others, which as well as the former are Galled moulds, onally they consist of leaves which instead of Farchment, are made of ox-guts wrought perfectly smooth & fine by these means he hammer a little plate of gow not more than one ounce in weight into sixteen hunds leaves three Inches square, or into 1000 square leaves of four Inches, which gives it above 180000 times more surface than it had at first. Without such a band as growing, to keep their parts to gather, the whirting about of the globes would Thatter them to Sieces & dipipate them aboad into the Circum amtient space. as our globe which at he rate of rooo miles antown & is composed of Earth & water this rotation would as casily throw of the parts ofthe Earth & water as the whirling

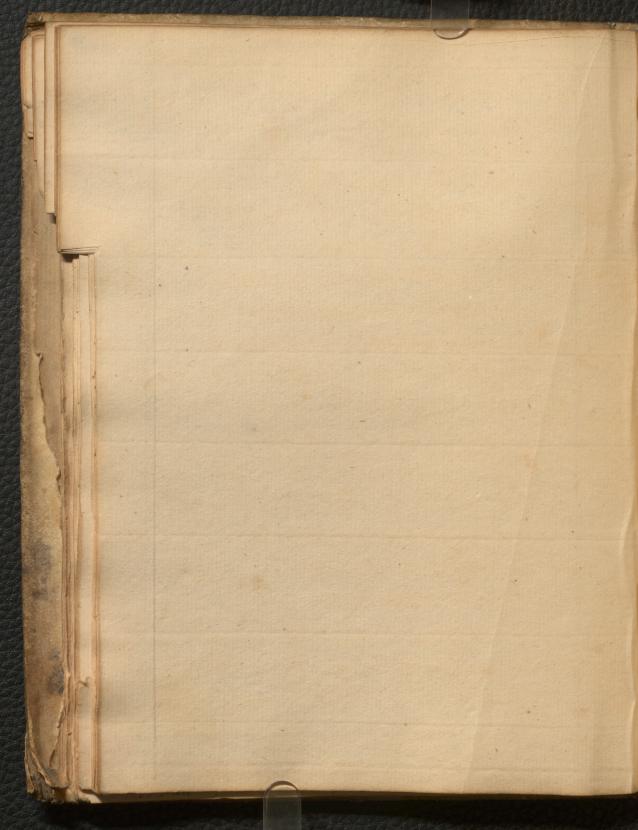
round of a Whiel or Giber would the bose dust of Water looged hereon, wid not the gravitating or Centipetal power exceed the Centifical proposition as it does 288 times which prevents all the disturbant fravil & stone Take of Jum Roadick, as much as will the upon a shilling in Tyber two or three times a Day. The humber of 19 year at which the sunt hoon Golden humber return to the same Frints they were fountly in meant before is what is call the golden number, My it. To latto by the athenians, who received it with Find it. so much applause, that they ordered it to be put in Large Characters of gold in the middle of the Sublick place. It has likewise been take the Lunar Cycle. To find the Gothen number you must add I to the number of the year & divide the sum by 19 & hegleching the Zudion mind only the remainder which is the Golden number of that year. what see methal.

Warch Watch Glupes are generally made from a plane Papes how piece of glass, by a Concave surface of from which money being heated will to soften the glap laid thereon mades see watch glasses in D' shaws about of m' Boyles works rol- it Thilosophicall ones how produced see Jage ye 7th To graft by scutcheon is to remove from off a free a sentcheon or shoot with a great part of the Bark, out of which it rises & to apply it upon another. They make a sort of Covering of Clay to the grafted trees, not only to hinder the action Grafting of the air upon the wounds, least it should dry up the fiber, & render them Incapable of transmitting or receiving the hutritive Juice; but that the hutnihive finice apending abundantly in the spring may be thut up from a popility of dipipating to Constrained to fill the vefels of the graft, which it finds open. The reason the graft bears the same fruit as the tree from whence it was taken is because the fruit is produced from the graft which received its reeds from the Tree from which it was taken; & because the fuices which flow through the fiber the graft do therein take

a Configuration Conformable to the graft. trees grafted are generally more fruitfull than others because they Commonly make Choice for grafting, of sets whose roots being more Extended real more Juice which is filtred through the grafts, being more pure, is also more propper to nourish. & bring forth the fruit. When you would have the shoots cover the wall The same year & leave no vacuity in the Espalies Espalian you must pull off the Blofoms, that so the sap not being employed in hourishing Either the flopon. Make them or fruit may afford mores to the branches. if the Branch of the scutcheon has that out eight or nine Inches it is good to nip it at the End, because the Tap being stopped by the part that is nipped, dried up & Incapable of accretion will cause a great number of small Branches to spring out which we bear plenty of Fruit the year following . 930. ree Jager ye 16 at the End of this Book. Pliny attributes of to thance ho says that some thericium hundant Quing through Thanicia with a Cargo of hitre, being about dreping Invention their richals about the river bells, not being able to Find any then to raise their besets they rised imps of hitro which prostily

took fire mined of Interporated with the Tand & ran into 34 Lette transparent streams, which soon longeald to Tought the ast of thinking glap, about 1000 year before thrist. Glap winds Juch as our from it Serome me may Conclude they were in we in the 3th ant vary. before that the Romans made thing windows & the Glupes of their litters, of what they land Lapis specularis which was in all probability what we call Falcor Fing lass senoca speeks of here as of long Franding in histine from whence we may presume they were in fation, before the Overthrow of the Common wealth. merter & S. W26th an account of them v 9:39.



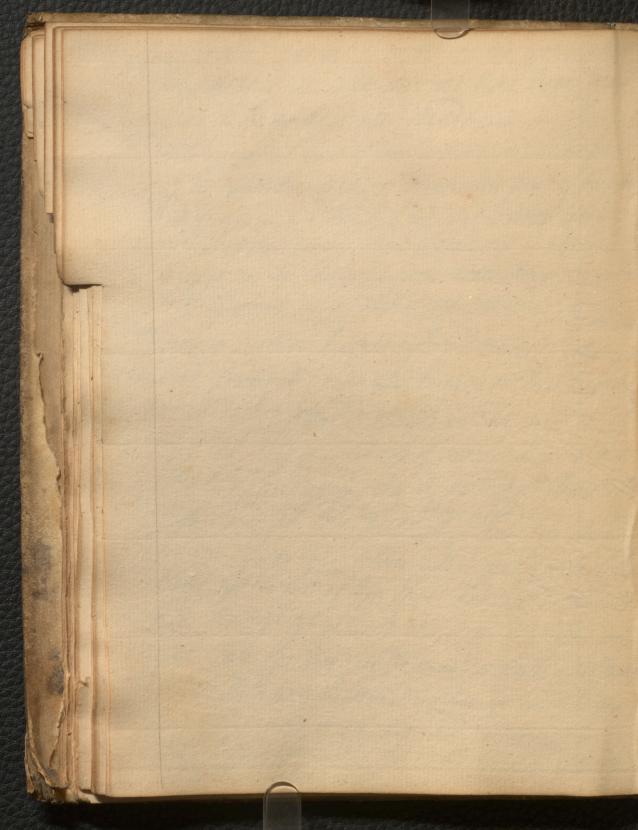


the Reason that Hay is so often hirned & spread upon Hay the ground is that those hot & saline Juices that are init man Exhale & Evaporate, which would otherwise forment in the stack & set fire to it. Heat the There are two fauses of the great difference between Reason why the winter & Tummer, Hear & Colo. one is the shorter or it is greater in the summer longer Continuance of the sun above the Horizon: in Jummer long, which increases the Heat as much as it er han he winter. Lengthens the Day & augments the Cold as muchas it lengthens the nite in the winter reason. The other Cause is the oblique or Perpendicular direction of the sun's Ray's the offique being weaker than the Persendicular as is Evident from holding a pook half open; overagainst an Municipated white wal, where it may be observed that the side opposite the wall, on which the Rays Strike Sependicularly is far more light & white then the otheride on this the Rays fall obliquely. The same it is in the Insiden of the Sun's Rays on any Stane, namely the Rays are so much stronger or the Plane the more warmed & Enlighten'd, as the Rays are more or les Serpendies or that on two accounts. 1st Because the Rependicular Rays Strike with a greater force than the blique as

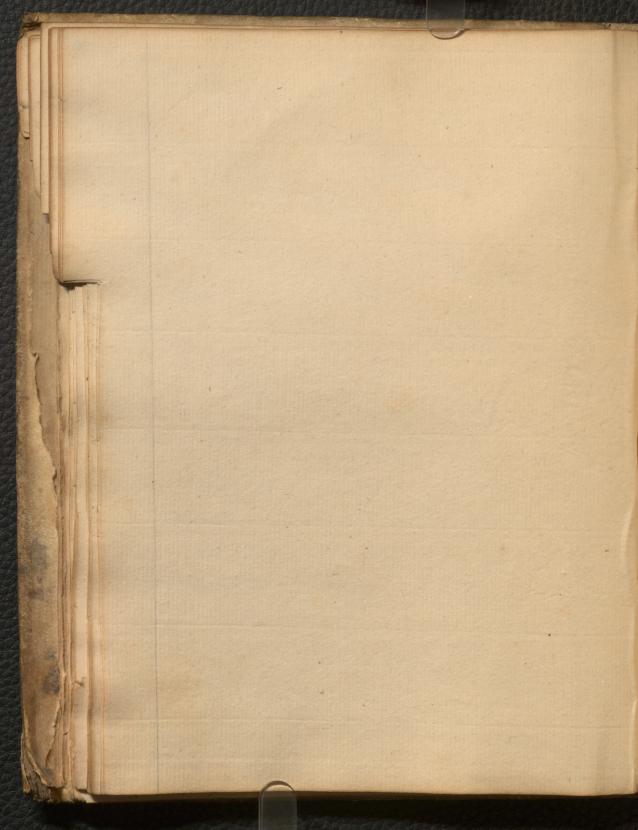
A in this Figure the Rays R.R. Inke the Plane AP more a forcibly than the Plane or. The action or force of which Rercupion in like that of all other Impulses) as the angle of Incidence. To the Force of the Rays & R upon the I oblique Plane OB, is as the signer only of BOB, whereas their force upon AP is as the wholesine of go Degrees, or anylo ROG. 2. another Reasonis, that a greater number or quantity of Rays, fall within the compate or area of any plane, in a Depoendicular, than Oblique Direction. This with be manifest from the base Inspection of the above Figure, where it may be observed, that all the Fays between RR & Op fall on the Plane A 9: bu only about one half of them would fall on all oblique Plane of the same length, if it was 06. also it may be observed farther, that as the Line of in longer than Op so are the spaces between the days larger in OB than Op & Consequently fewer Rampal on ob for its length them on op for its length, or herays they are so they are so much the stronger, and Evid

from the Collecting & Embensing the Rays by a Burnity Glaifs. Durh: astrone: 9.93. gorometer may be made with Cargut father A TET DEC as at A & C & Gade in the middle with the weight is which will lower the string according to the degrees of dry rep or moishure of the air. for when the air is moist the warm bapour insurate themselves Early into a string & swell & shortnit. The moist vapours his inute themselves very tradily into wood & are of so great a force as to Split very hard rocks. Willstones are broke from Rocks by this means, for when a Rock is act into a Cylinder they divide that into several leper Cylinders, by making reveral roles round the great Cylinder at distances Proportional to the designo Thickness of the milistones: & filing hem with as many Sieces of sallow wood dry in an Oven for when the wet weather Comes they Either swell & Break or Seperate the aftinonia Rock into several Rieces. The great Lower of the air may be Imagined from this. when serchis is set up the great obesisk of the batican, the Calles being nade longer by the Frodigious weight of 1806048 30

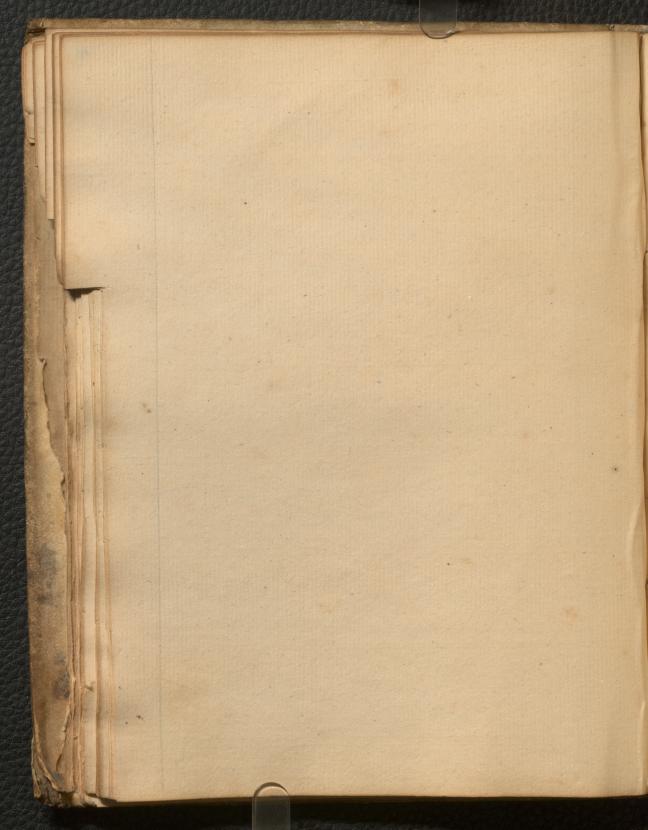
he ordered the cables to be southed, upon which her munch to, that they let that thege map you its base as it now shares. manna on the leaves of Trees, is the most Exalted part Honey of the nutritive lunce of Plants. This part of the hince being refined & rarefied by the heat is thrust into the Through the leaves or forced to come out, it happires through the les Contracted pores. hence honey retains the taste of plants upon which it was gathered. Tolesthy with 9:39 to keep Take a Quart of Lindeed oy 6 & 2 ounces of Litharge of outrain Lead powder it finely misc them & set them on y for In an Earthen pan tel ym foil an hour more or less till ye of he of ye Thickness of Treakle, then set it a When on you have again stor it put out you flame when for use? If you hise colours with it put 3 parts of plas Liveed sell to one of this. If for hat case to keep out run take ys Cyl so disolver there in on y fire some good Rosen for fum lack but deaver) to much as to mak I's lyl thich as a balsom. When they are disolved you head Either work it off so or and veroigness or any other Colour est Things should be painted with this



-KIRIZIOPICA -



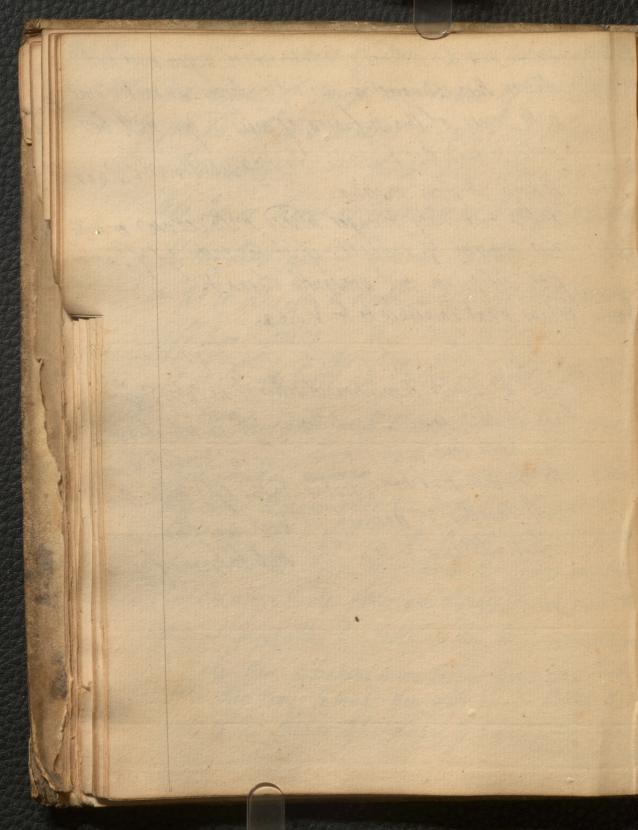
IKINOP T

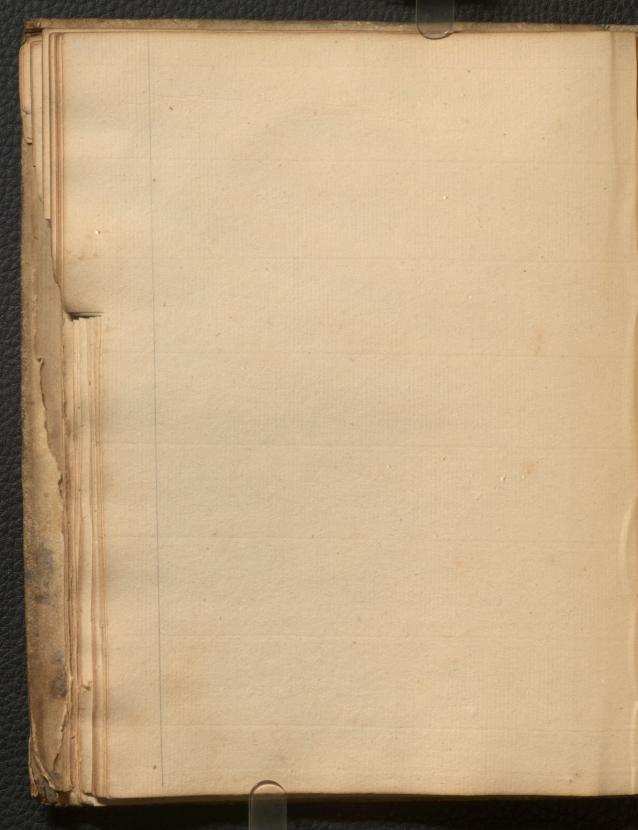


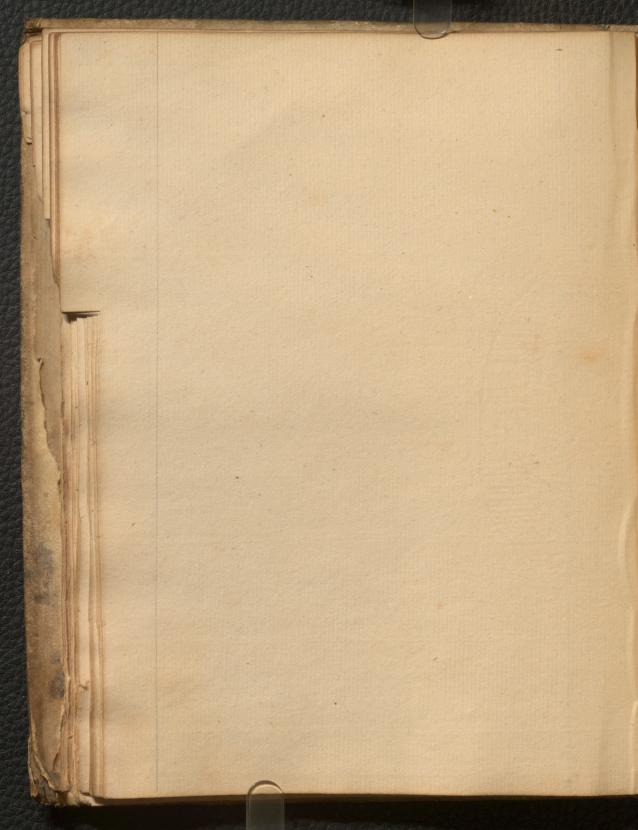
to make one quart of Ink. INK -Take & ounces of Blew Gaules, 2 ounces of Coprice, ones ounce of Gum araback, one ounce of white Jugar Candy & one quart of water, bound the gaule before you put them into the water & the them for I days thrice o day. INA Rei Toak the white of an Egg thirty hours in a spoonful low to make it. of good Rose Finegar, throw away the white & Thain what remains through a Clean Cloth. then Reco it Carefully in a biol & by mixing a little . vermilion there, with will make a very good no Sut into a new & well cleand Earthen Pot some ruk that nay or may fair water in which Infuse a little orpriment not be seen with a Liece of quick time for 24 Hours & so at Pleasure you have your first water. The water with which you write the mirible atte is a gallon of dishill Ginegar Foiled for half a quarter of an hour with an ounce of Thange relier. These must be taken care of & stopped.

Take four ounces of Brasil wood Cut small JAK Ree how to make one owner of Cerup, one owner of Roch allum pound all in a mortar to power on winestill all's Covered, after three Days standing strain he liquor three or four times through a Clean Cloth, then put it into an Earthen white lasin I let it dry in a dark place? at last scrape off the Flower of this dry substance & keep it to be deluted in fummed water for use. made in see D' Thanks abridg: of m' Boyles work: vol. 1st 91318135. Instrument of musick the older are generally Externs the more because when the wood is newly art, its Enstrum fibers are defels full of sap. in proportion as the wood ent me grows of the sap is dissipated be the bestels are dried up: Consequently the fibers are disjoyned from one another I more moveable; the Intervals they leave permit them to make their bibrations more Easily; by making them often, they come to make them with greater facility, the tone of the one is less changed by that of the other.

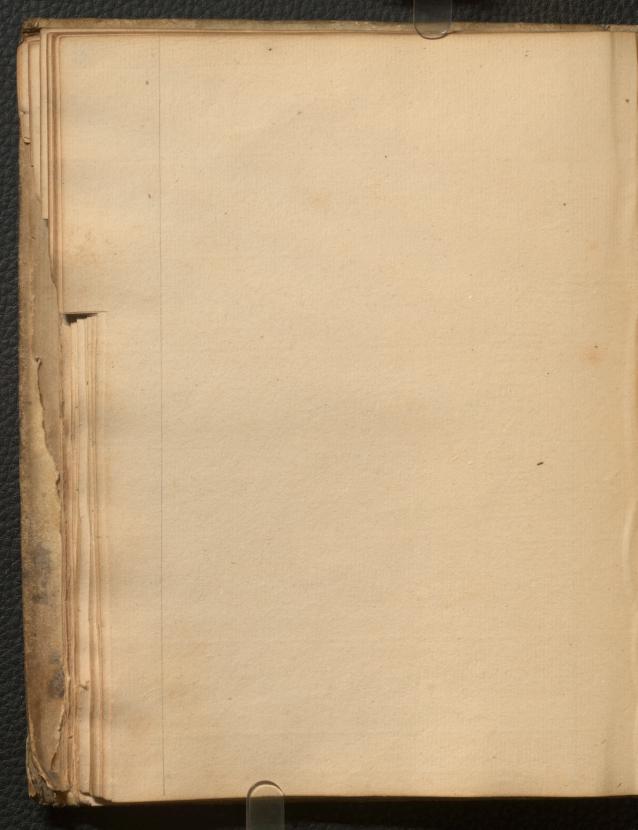
write with the solution of white vitrol & you will not disem the Characters. Sprinkle these Characters over with some of the Infusion of gails & you will be able to read the mirible writing Dales Thy: vol. 2 9407. to keep it from musting relit over with binager mixed with ceruse or with the marrow of a heart. if it be musty of Sartar per delignium will prosently cleans it. Fataus what I magined to be v 9:62. to keep it from rushing as fine Locks Kinges Guns xe take yo Charest Furpentiners disolve it in by of Surpenti and to this some Linseid drying by in which see lead hath been misced made Clear by Insolation for for Common wes take drying linkers out mise them well togather & Barnish y work very thing over withit whiteing it to y ofine with take it of again.







KIN ZIOPICA



in Erder through a harrow apperture, into another Som placed at the distance of about 12 feet the gellow Green, Colours rays the falling through the same aperture, in the same manner & upon the same point of the second prism will be refracted to the same place as the Red, but too Toint at some distance from it on that side to which the rotation is made. This is what I's henton call the Experimentury Crucis: being that which ted him out of the Dificulties into which the Fost The nome wou we had Moreon him. As plainly there a different degree of refrangition * a different Colour Corresponding here to in he rays of light & hat yellow lare more refracted than red ones IN Is green ones more than yellow ones & blue is notet N ones most of all. if the Rays of the san fall very offiquely on a Inim Those that are reflected will be violet; those refracted red for the rain were Coloured before any reperations by howmuch they are the more repangible, by somuch they are the more Easily reflected; & by that means are represented. Bodies only appear of his or that Colour, their surfaces are disposed to reflect; or at East more abundantly than any other. all hatural Bodies Consist of very hin Fransparen Lamelle, which if they be disposed with regard to Each other as that there happen no reflections or repairing

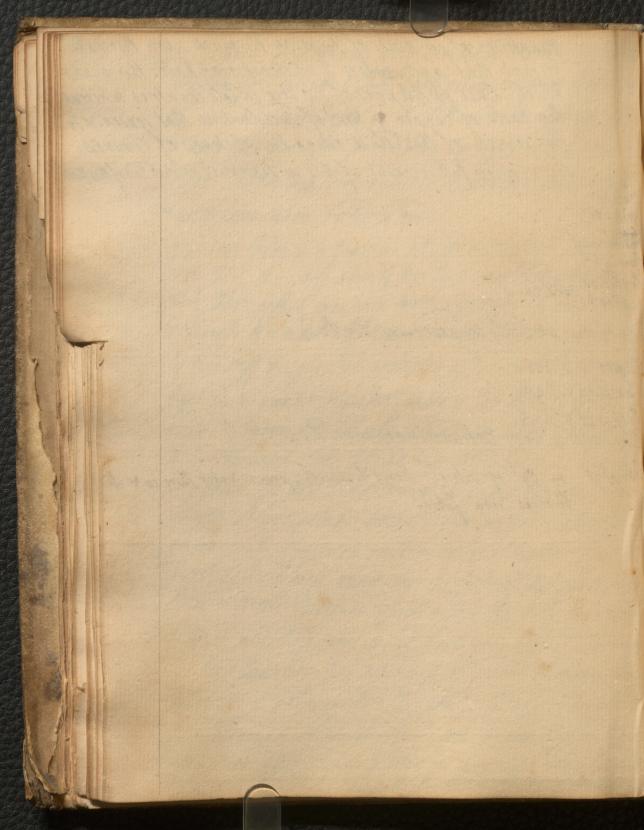
in their interstices, those bodies become Transparent but if their Intervals be so large & hore fill with such matter, or so Emply with regard to the part themselve as that there happen a number of Reflections & Refractions within the Body the Body in that case becomes opake. The Rays which are not reflected from an Cpake Body penetrate into it & there suffering Innumerable reflections & refractions at length unite themselves to the particles of why a black the Body it self. boy grows hot hence an opake Body grows hot the sooner asit reflects somest light lep Copiously: whence we see why a white body, which reflects almost all the rays that strike upon it heats much more slowly than a Black one, which reflects scarce any if wo Towders the one perfectly Red, the other blue for mines any little Body pretty deeply south this mixture, & Frewdhin a Prism held to the Eye will Exhibit a double smay the one red & the other blue: in regard, the red & purple or blue rays are seperated by their unraven refraction. The Colour of Coloured Rays well reperated by the Frim are not at all Changed or destroye by paping an Illuminated misin or by their muthal Decupation, their bordering on a deep thaton nor their being reflected from any hatural body or repracted through any one, in a place how reever obscure. The reason is that Colours are not modification arising from refraction or reflection, but Immutable properties, is such as belong to the newtire of the Rays.

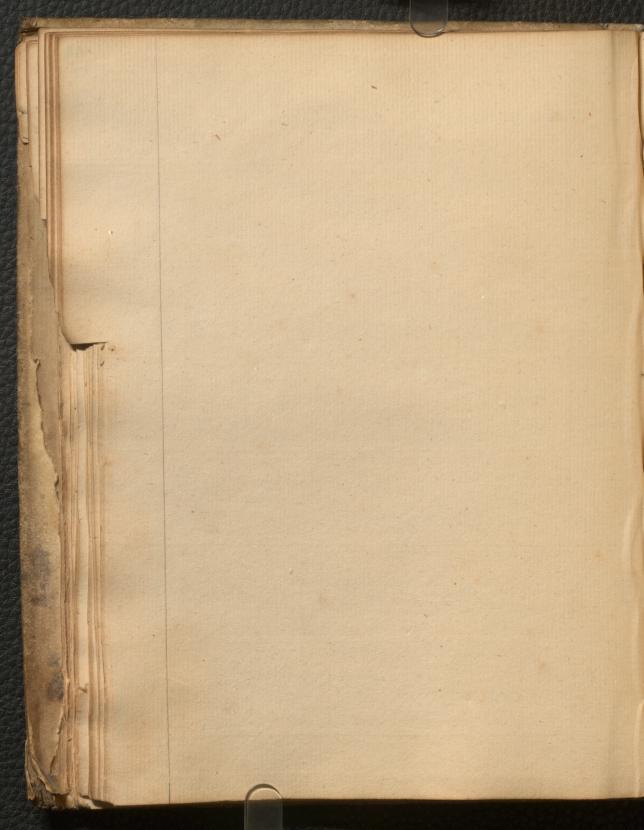
Red Green yellow rate & biolet Colour being mise'd in a 47 Certain proportion appear whitish is are of such a Colour as arises from white & Black mixed: & if there werere notion Rays absorbed & lost would be plainly white if a Paper out into a livele be stained with Each of More Colours Seperately in a Certain proportion & then swiftly herned found its Centre the inifrach of the motion will mise her Colours in the Eye & the whole paper will appear of a Colour between black & white. The reason why liquor appear of different Colours in a Conical repet in different parts of the glass is that her rays are more & more Intercepted as they pap through a longer or a shorter section of a Depel. tight how I'S henton supposes all Hypothesis's to be Erroneous in which diffused. light a suppored to Consist in prepion or motion. if it Consistes of prepron propogated without actual motion, it would not be able to hear & agitate the bodies which refract & reflect it if it lasts in Motion propagated to all Distances in an Instant, it would require an infinite force Every moment in Every thining Particle to generate that motion is if it consisted in pression or motion propaga in an Instant or in Time it would bend into the Thatow for the prepares of a fluid arising from gravity tends Every way with Equal force. The waves of stagnating water, pating by the sides of a broad obsticle which stops part of them, Rend afterwards & tha themselves gradually into the quiet water the hind the obsticles. so also does the Fibrations of the nir the not so much as the waves of water, for a Canon may be heard beyond a hell which Intercept the right of the founding Body. But light is never hans to being into the shadow. The fixed tan by the Interposition of any

the Planets cease to fer seen. The raws which pap very near the Edges of any body are bent a little by the action of the body fut that is from weeks

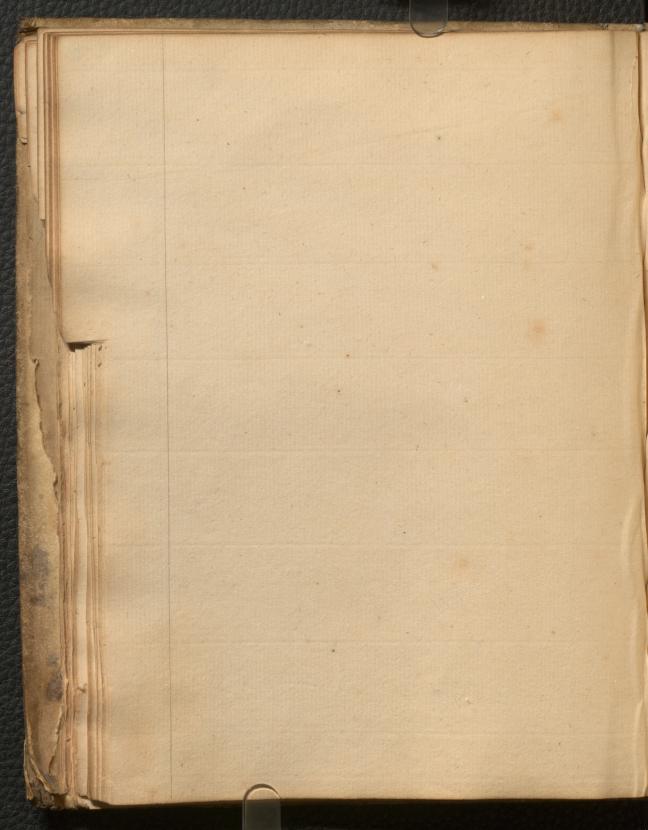
in Conleved objects are only a certain texture of Parts Colours propper for directing they particular of terres Coloured in Can any one not agree to it if there reces nothing but a new textures for presenting the Eyes with a new Colour: Black marble reduced to provoder grows white & a Cobster when boiled is red. a white Body is a Feature of stiff & spherical fasticles or such like? The shift absorbs the least rays the sphericalors such like reflect the rays more Copionsly. a room whited a thereby the more lightsome, because the Rays being reflect by the stiff & spherical particles of the surface thike the Eyes on a greater humber. Why is the foam of water White & Eaven Ink it self? because the small parts, wherey it is composed are formed into globules or at leas into Tolygones. For the same reason pownded glap becomes white. Tilver plates grows white in hot water Impry hated with Common salt & salt of Fastar; because those falls which graw the surface of the silver, make therein small Polygones which reflect the light from all pin without absorbing any or at least very few of the rays on the Contrary the whiteness of reliver is diminished when it is polished the Reason is because the globules or Johnsones of its surface are made more Plain. why Does Houses grow whiter in summers g when the hear dipipates the liquid Prices, the the mich effects a greater

quantities of all how of Rays. Is his much upon the late account that age spreads a whitenep over hair. The winter which finds up he pores of the skin in Colo Countries whitens The Haves of Canada & Moses of Sweedland in that season. & fo the severity of the Esto is owing the whiteness of Emines. tee a more full account of this in Jago your at the End of this book microscopical four: oth Conladies & 9.26. lay of what probably composed. see 8.28%. Caper v 9:33: Camelian v. 9:44. Coepinul v 9:26. Chesnut a very Eschraordinary one. 9:64. Samphyr in Only of vitriol Corses its smell power water there on & it,





LE PIOPICI I



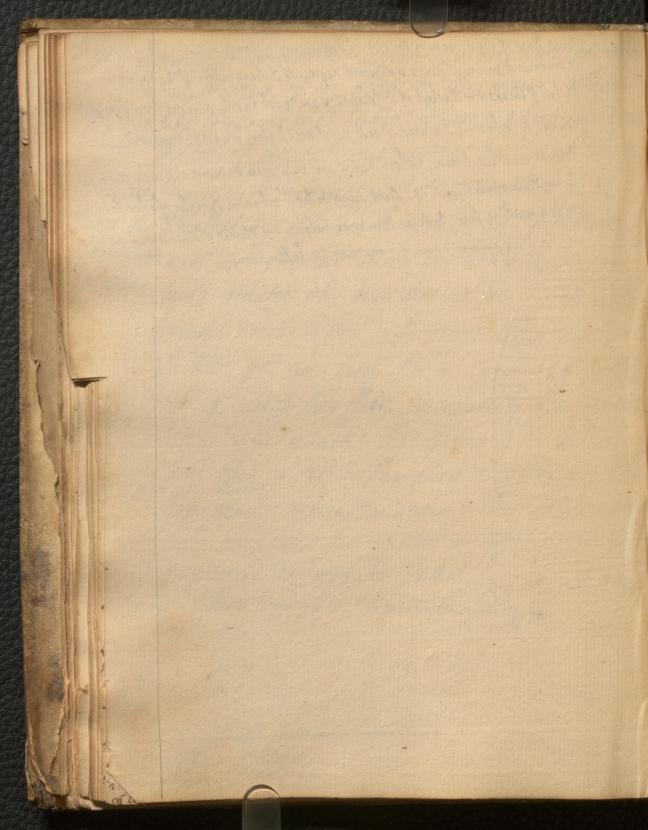
Consisted of six Thousand then after the reception of a Legion the Sabines into Rome, the Common number in the himes of the Free state was 4000. The rumber afterwards in the war with Hannibal amounted to 8000. Ever after has 4000 or 4,200. The Horse required to Every Legion was 300 obivided into take Turmo sin Each. a Legate was something like a Parigodingeneral with us. Legate light at the rate of to minutes or 480 seconds in paping Light. from the sun, will be found to fly 264.816 miles in a It coul of time. his found that a Bullet at, its first disharg from the mouth of a Cannon, flies one mile in a little above 8 1 seconds, & therefore would be 32 2 years in arriving to the sun, hence tis plane that sight flies 3112 times faster than a Bullet at its first discharge Lightning Lightning is there occasioned: the air doth abound with steams & Exhalations of sulphur, betumen hetre, salt of variouse sorts, acids & alkalies, these being raised by The sun's heat, into the higher regions of air, are there dispensed & bentilated to & for by winds, this agitation produces a mixture, & Consequently a fermentation of those combustable sulphurs with the hitrous acids, which is often to that degree as to kindle into flame the thinder is produced hence as the brack of gunpowder orof aurum fulminans, & the reason he do not hear the oak sooner than see the Fire, is because the sound is slower in anviving at our Ears, than light to our Eyes. what is latted a thursderbolt is nothing but more solid & most rapid fine

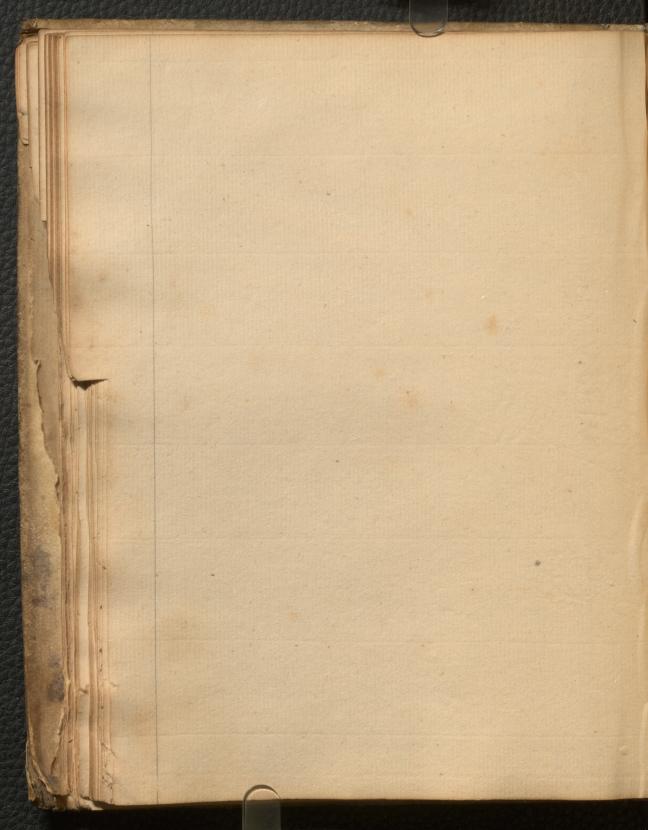
which flies through Everything that stands in its way. It generally affects the Highest places, its strange Effects to philosopher lan but Conjecture at, Imputing it to the different figure & qualities of the particles of lightning which renders it Capable of disolving some substances at the same time that it will not touch others. when a fat unctions vapour is kindled & wafted about by the motions of the air, near the surface of the Earth, like a light in a lunthorn we call it an Ignis Fatuus. hew toudi is a strong & Topulous city of staly in the Loudi Dutch: of milan subject to the king of spain remarkable for the cheeses which we lall parmesan, by reason that a princes of parma, as the story goes, first brought it into suche The Parishede of a Place on the Easthly globe, who Catifude distance of the Zenith of that Place from the Egu Either horth or south measured by the Degrees on the mendian. The Declination of the sun or any star is the same as Latitude on the Earthly Globe. The Latitude of a star is its distance north or south for from the Ecliptick. alkin The alkinide of the sun or star is its distance about the Horizon measured on the Luadrante of altitudes.

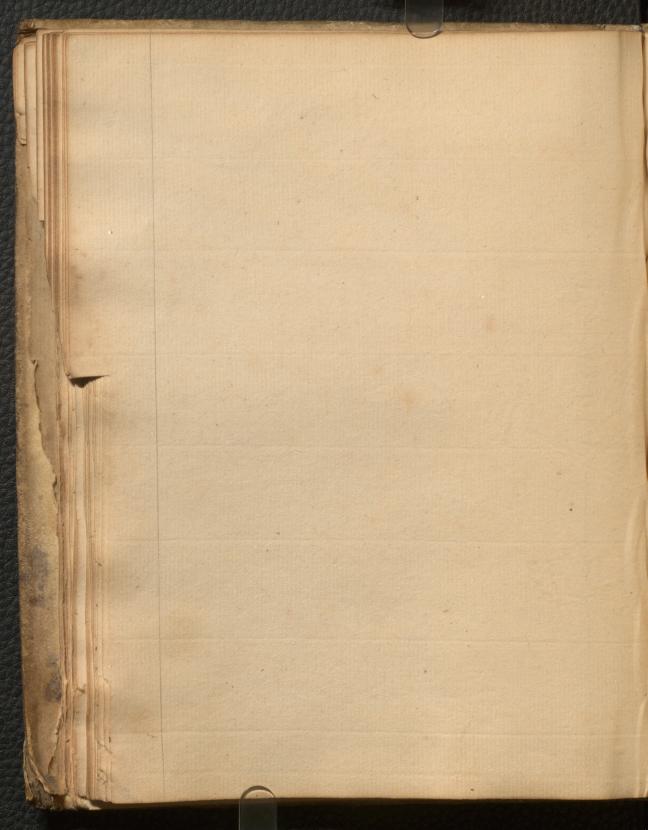
is the Time of the sun or stars rising or setting before Upen lional difference or after six a Clock The Longitude of a Place is the distance of it to Longitude wards the East or west from some first mendian. & his measured on the Equator? The Right aftension of the sun is its distance from that meridian which but the Point aries measured Eastward on the Equator. his much the same with Longitude on the Earthly globe. The Longitude of the sun or Trap, is its distance from the point aries Eastward measured on the Ediphi N but with regard to the son or Hanet, his usually or only called the Flaces of the sun or Hanet for any particular day. Ceaves The leaves are highly necepary to Fruit because the their use Juices are trought to perfection by circulating therein. besides leave serve to defend the tender fruit from the Injury of the dir. Accordingly when you see the caterpi devour the leaves, you see the Trees languish & bear only abortive Fruit. Jales Thy: volso 9: 89. Lightnings are materials Elevated in Exhalations from lighting the Bosom of the Earth as far as the upper region the Bid reunites them & after this reunion they do not

remain suspended, but because they are sustained by the klowing of the winds, or Else because altogather they Compose one Entire bolume, which has some Except of surface in proportion to the map. herefore lightnings they mean be rarefice in the Intlamation as his whence the Homberg has observed & may be in Equilibrium repeated flashes with the fine air which surrounds them. This proceed. being granted why may they not be inflamed at several times? after Inflamation altho they be more subtile, yet are they All in Equilibrium with the air in which they foat. Consequently they may rim therein to be reunited. The spring of the air being Compressed in the Inflamation, & dilated again draw Men heaver one another again, & Their agitation makes them Encounter one abother as before hence hems Light how diffused according to 19 hearton theory see & does what probably boursons of see 9:28. coverent of barren, ones 9:64.

The Rays of Light seem to List of Particles of different sizes ! It being necessary to produce if various Colours , o different degrees of Refrangibility) y leat of which make Light biolet, I weakest so clarkest of of colours so are most Easily diverted from y right Course, by refracting surfaces; y rest as y are Figger, make y Stronger's more lived Colours, as Blue, Green, yellow, Red, of are with more of more difficulty diverted. Chencys Thilosophical Theory Flog. Light seems to be y vibrating Particles of a hot body driven of by a repelling force, with an Immense belocity. & Flame of sulphureous or oily smooth of a hot Body agitated to such a degree as to be Inflamed.







a luve ferit. half a nounce of Ethiops mineralis to 56 mange half an ounce of antimony mixthem to gather & give the dog as much as will Lye topon a shilling in a Freeze of Britter which must be repeated Every morning the the moon is about so times less than the Earth, & about the moon 238,920 English miles distant from it it movether about the Earth in about 27 days 7 hours & 43 minutes, & about her own ascis just in the same time. There is a surprising deal of workmanship in the formation of their kings which joyns the upper & lower shell of a muscle as also in the arrive the manner & honverful movements of those little musular My of its opening fibers & liquiments with which it is fastered. No hell. when it has a mind to shut it self clave up, with o when it has amind to shut it self Clare up, with 0 in its valted fell, it discharges a Certain liquor B unto those little muscles which causes them to dilate & swell, & Consequently shortens heir length & brings both the sheds, to which when it has a wind to open by withdrawing that agnor it relaxes the fibers & Consequently spensagin. millstones hillstones how severed from the Rock & art see Goods by making small holes in the rock to after filling Them with dry wood upon applying water to the wood twill to med as to bre dreat tices of.

place a thin piece of metal or a froat upon the metal Hun plates pen heads in form of a triangle, put thereon as there of much flower of Brimstones as the plate will had Istit! Is let it But away after this the first shope by flinging it on the ground with split it in two pieces. It shows abridge of Boyles Hor. volit. marbled marbled paper is made by touching the surface Palser how made of a repel full of water whereon the propper colons are Conveniently Blended. I shows abri- of Boyles vol: 14 minium see Colours. the Reason they lengthen by a Wiredrawing from & sman a hammer is because their long & ramore parts run upon one another without quitting their hold. with Julphur vitriol & Earth is made a species of artificial From teel is only refined from see I 184 vol st of Dales Phys. miner waters see springs. miron Converce represent offects I maller than they are. The convercity of these mirours causes the Effectual rays to be reflicted to the Eye only by a very small surface. Manna see Honey. Tales Thy: vol. 2 9366. marvel see Plants.

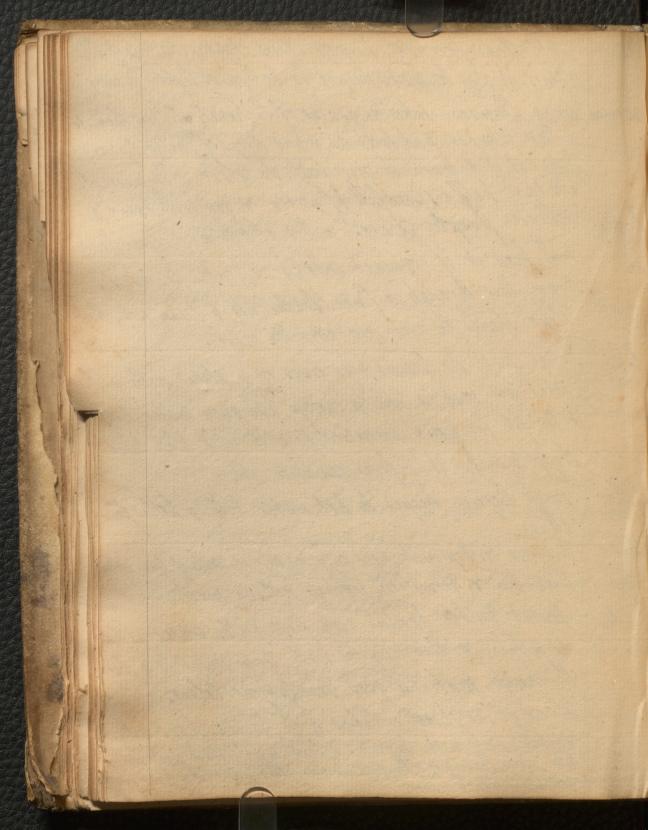
100 in 8 neato ogs. by mistake meteors milden if the moon had a sensible atmosphere we should mists perceive some change in a fixed that, or planet that approached too near to the discus of the moon & withy moon no Howched it. The papage of the rays through this atmosphere Atmosphere & their refraction would change the situation, splindour or Colour of the star. which no one has yet perceived. They lest account for the heat of some of these mineral waters Who supposes that two streams having run faro, & Emtited reveral rooks of different minerals, meetal last & mingle their liquors; from which aries a a great fermentation that Causes heat as we See in bihiol & Fartar, which when mixed Cause an Entense heart & Ebullihon veron: Go. 9 Didex: have fingers to work their nebs. 9.12 in a Frodbuse the Ophick nerve performes the same office as the processus asiares to our Eyes they lan at pleasure make their Eyes as the prominent or Contract them to a hemisphere. In. Observation, 3 the Systele & diastole observable in a touse ? 9. 4 the Butterfly has a spiral trunk which he can unbend & usent pleasure his so Contracted not to be troublesom & were long in proportion To his leggs. 912 a few heart may to offered to beat some from 919 I the Field spider's head or Eyes are set just as a Crabs walso his hould six I here may be observed a red mike on the las of spider which leave Them to soon as their life departs. Their neck & shoulder which they heart heart heart souther which they heart heart feat 924.

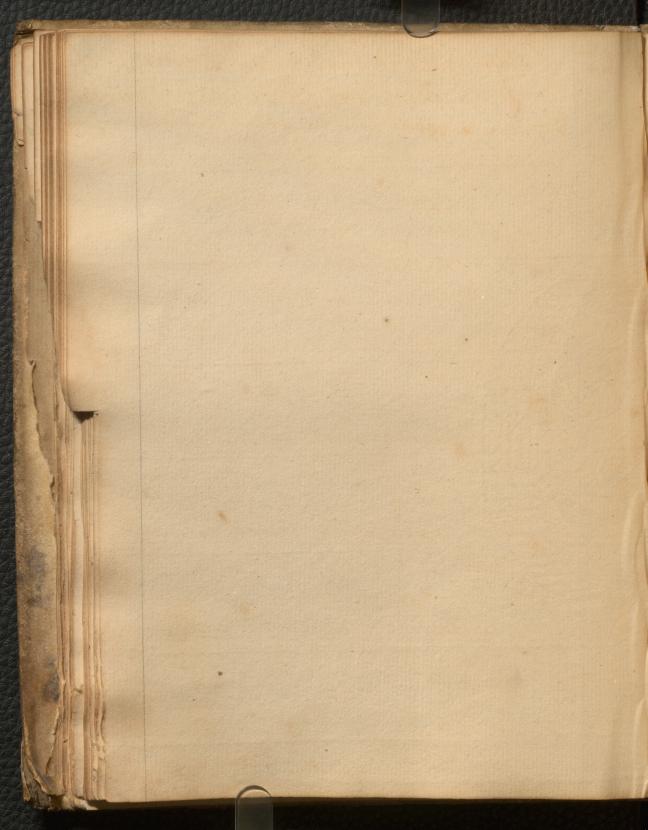
9 Euckow Spit. 929 10 horoladies Eyes may to seen by putting her head on ware & the putting of the heart to taking its voing's off the head has been off sometime 11 The Lamprey has a hole at the back of his head through which his sports the water he suchs in through the hots on Each Fide his tien fest des which its heart is Incrusted in a lartilago or existe to Presence It as it has no bones from Syjunes. 940. 12 the reed of strawberries may be observed on their outsides. 844. Look at the Leaves of sweethier, English mercury, or bonus Kenerius of Rue & Sage. 9.30. Tilla Sheophrash 932. by Compression of the herves the propogation of the animal spirit are hindred: when motion is restored you may feel something organ into the member tingling & stringing which is the return of of the animal spirits into that part seo? by tall the frequing microscopical observations see D' Power's microspical observat Pages of disches. moon That all objects beyond a certain distance in the heavens swifts contain affirear as in the same segment of a livele the stars Horizontal Sufficiently testify. This Segment by a medium from second observations & found to be 3 of 4 times greater near fan object Earth than Over head, so that the apparent mayoris measured by the Angle which the 2 rays 28 Coming from the Extremity of the Object make the moon must consequently appear larger heavesthe Earth than in any other position. as will sufficiently appear by the draft the nexed. where in 30 perfesents the real AA the apparent situation of the moon which must appear according to the Dopportions discribe by the flack spots in the lower process, because we Indeed all offects in the heavens

to bee placed on the dry surface. as on Earth by the quantity of Ground to in the heavens for can on the Turne of the distance of object by the quantity of the that seems to be between them. Smith's optichs. 963 vol. 1st. The Reason most donds seem to be of the same height Eacept bery near the surface of the Earth or driven by brotent or longer tornor is because there is no visible substance Extended between them we have nothing whereby to Enoge of their different distances. Inith's Opt. The fest see will not be able to see a white lincle upon a Black ground or a blac one on a white round when it Internos a les Angle at the Eye, than 2 thirds of a minute or which is the same when its distance from the Eye Exceeds 6186 times its own diameter? Smith spot marble ! shells Hants Fish & Animals therein accounted for 9:29 metalick Bodies reasons for their fronth 9:30. moth v. 9: 34. minerals have a kind of Growth 9.28. mushrooms Jen 9:32? miselfoer 9.34. mobes v. 9.35.

maps of Take of Fastar, & Gum water is necessary, for of Lye of Sathar art of Bring take 2 ounces of yo fest white Fartar grap it up hard & tyest half a sheet of Brown Cup Raper, gret it throughly in water A part it into a Clear fire of let it stay the red hot quite through then put it into a pint of water, & with your finger rubit two you flack will all settle, when clear power of your keep it Close stopped for use. I hake gum water take 3 ounces of ye whitest or Clearest fam Walick & feat it small & put it into a pint of spring water, if an forbuch appear after you is distilled Arain it & then put it into a slap of stop it up till used ado this will not keep good above 3 months. for Gopper Green, take a pound of French Gerdigrease &3 ounces of Gream of Fartar Both beat to a fine powders mise them in 2 quarts of water which boil till reduced to one train it when Eold & then let it stand to settle till ye ligner be very Clear & hoil be a delicate green. if you would have it deeper boil more of it away, this blue Kept alese stopt will keep many years. astone For a stone letter a pint of Tartar Lie put into it an Colour ounce of y best myork in power boil it hill y myork disolved which hold be soon at it settle is power of

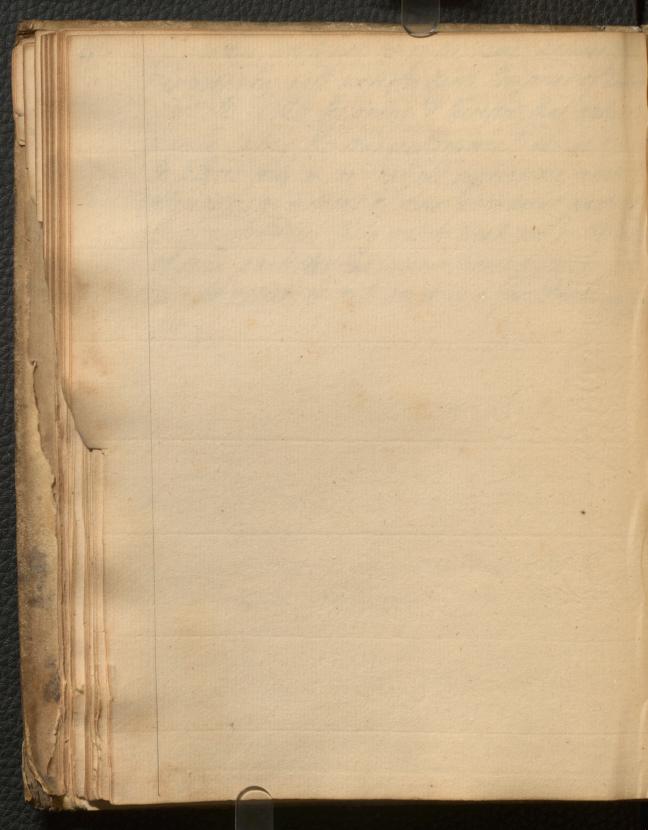
no Clear for no keep it Close stopt is with last parts Heart. it may be made cleeper by boiling or lighter by willing not Coursen for a Crimson take 30 grains of Cochinele struise them to a fine powder, put to it as many drops of Tarkar fue as will Sust wet it is make it give forth its Colour; to Immeriately Suple Delicate purple Colour. a bit of when I craped finely will furn it if required into a delicate crimson. Strain this through a fine Cloath into a Clean pot, this Colour should be used soon after his made. Blue Judigo must be ground very fine on a stone with a little Tastar yes when his like a surrup and gum water hill The it be fit for your purpose, keep it in a glass close stoppt & shake it before you use it. French Bernies Reeped in hot water with a little pour Tellow Red Red Lead & orpiment need only be mixed with y frem water Blue how & bermilion require hothing more Burnt Ember ground very fine with water as this Imber as posible to then tempered with Gum water to a due Mickness make a good Frankparent Colour. Colour y Sea shower & takes with Indies. this south Amber sails with hyperh. if Land do y Lightest parts with thin yellow, Thading it with Expirent, in other podots let a light grant

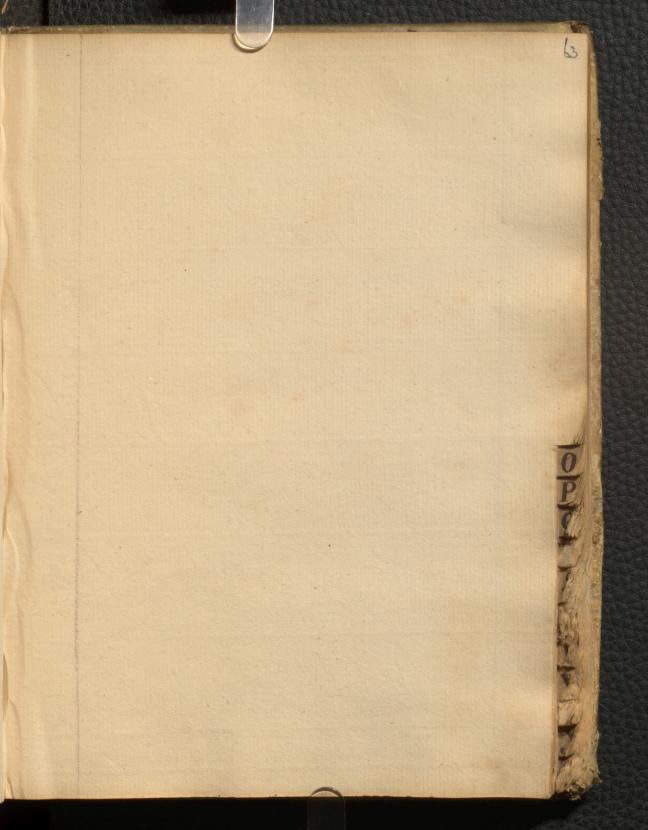


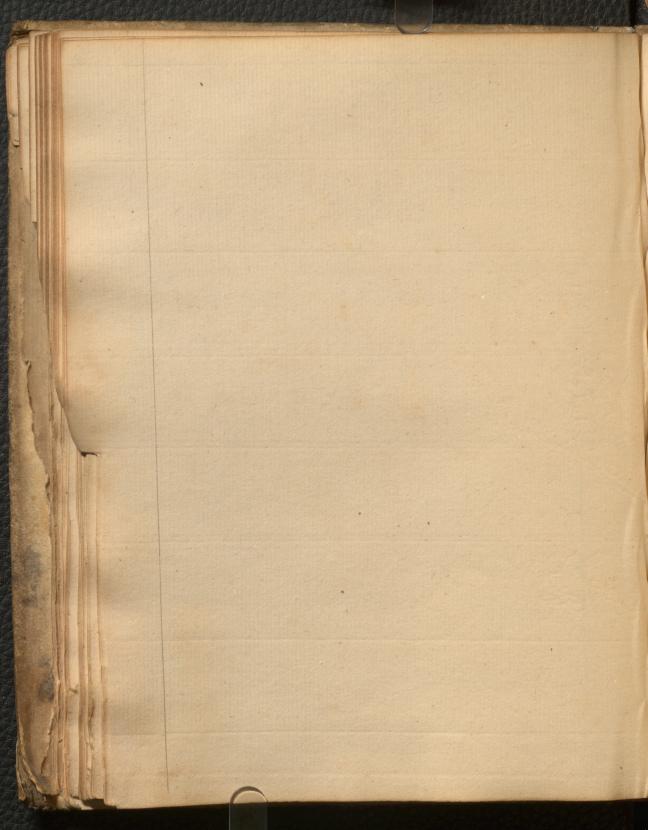


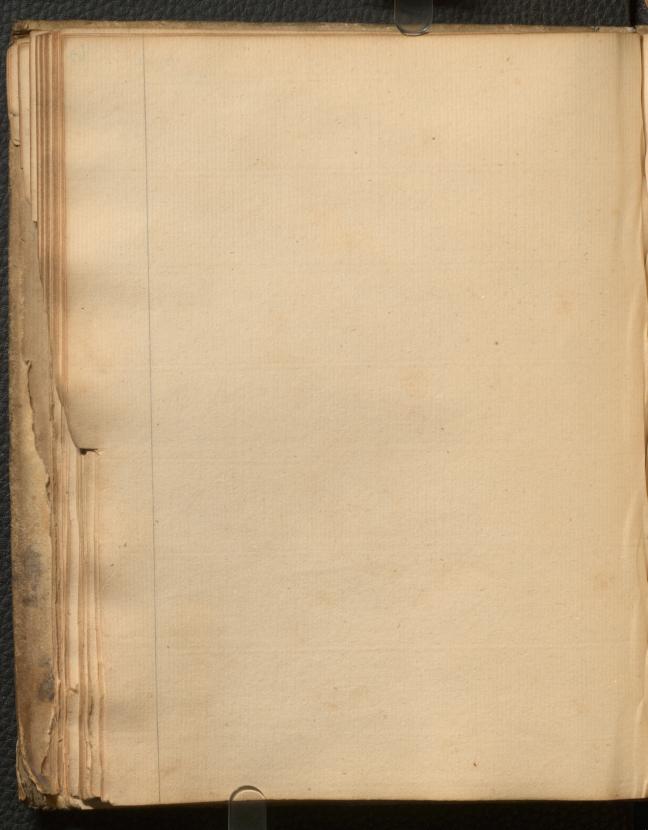
a definition Nature is the Constant & uniform operation of World. Conglishers ser: on the possibility nature & cetainty of mira You may see in the middle of the hard point of the hether That prickles of a helle a Small holes through which a sharp & venomous liquor Contained in the base of the Inchles, runs into the part pricked & causes a pain Therein by grawing to tearing the fiber. July Day bole Bo hature representation rentons. Explaination of hem. It seems Inneiptes probable to me rays he, that god in the reginning former matter in solo, mapy, hard, Imperimite moverable particles of inch sizes & France & note such ther properties & in such proportion to small as most Bondenced to the End for which he firmed them; & that there primitive particles, being solid are Incomperably harder han any porous Fories Comme of them; Eaven so very hard as never to weat of freak to Sieces: he ordinary power being able to Tirilo what god himself made one in the that Greating while the particles Continue Entire; they may amone Bodies of me of the same nature & Feather high hature of things desending on them would be changed.

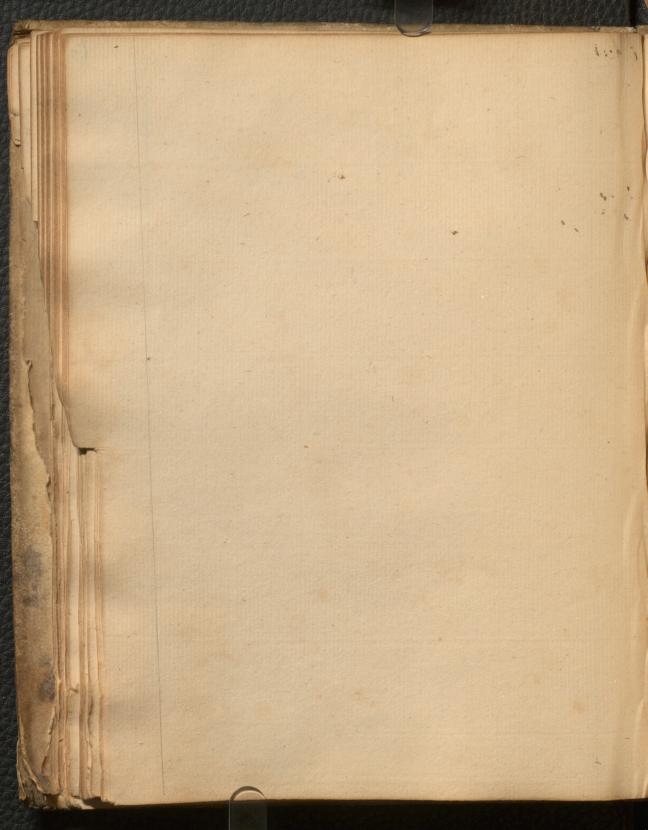
of particles, would not be of the same nature & Terchire now with water & Earth Composed of Entire particles in the beginning & therefore, that nature may be lasting the Changes of Corporcal things areto be placed only in the various reserrations & new abociasions & Instions of these bermanent particles; Compound Fodies being apt to break not in he mids of solid particles. But where those particles are Taid to gather, or only bouch in a few Points remiser 19.44. neuts



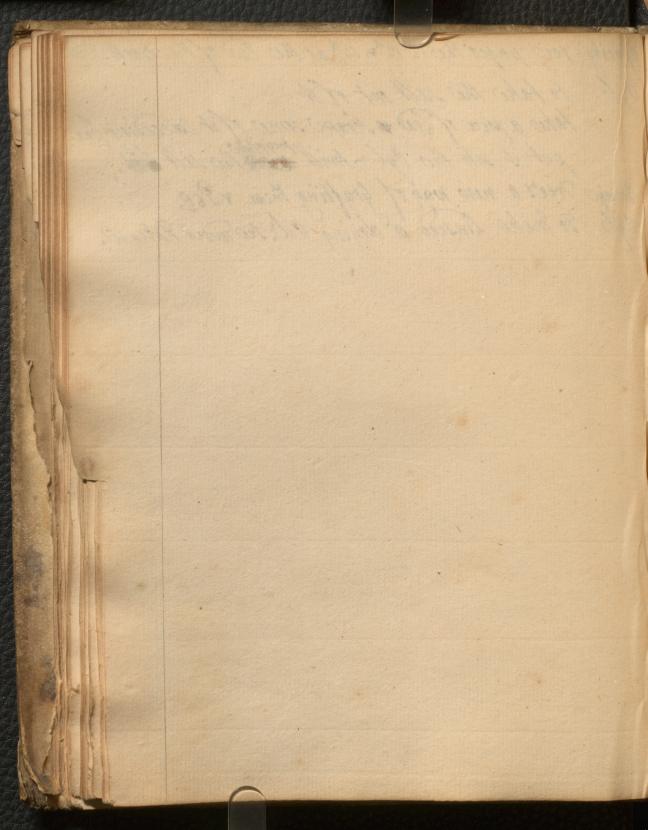


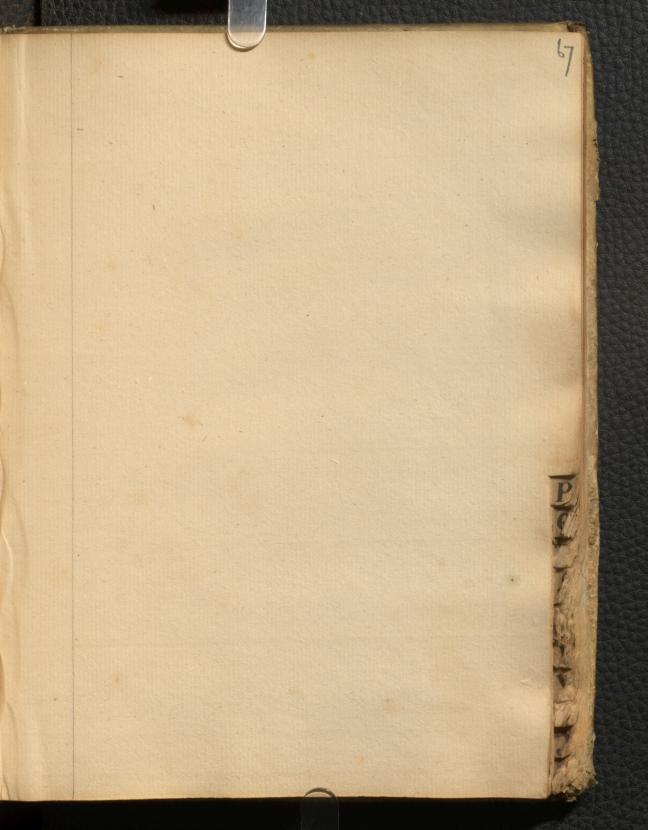


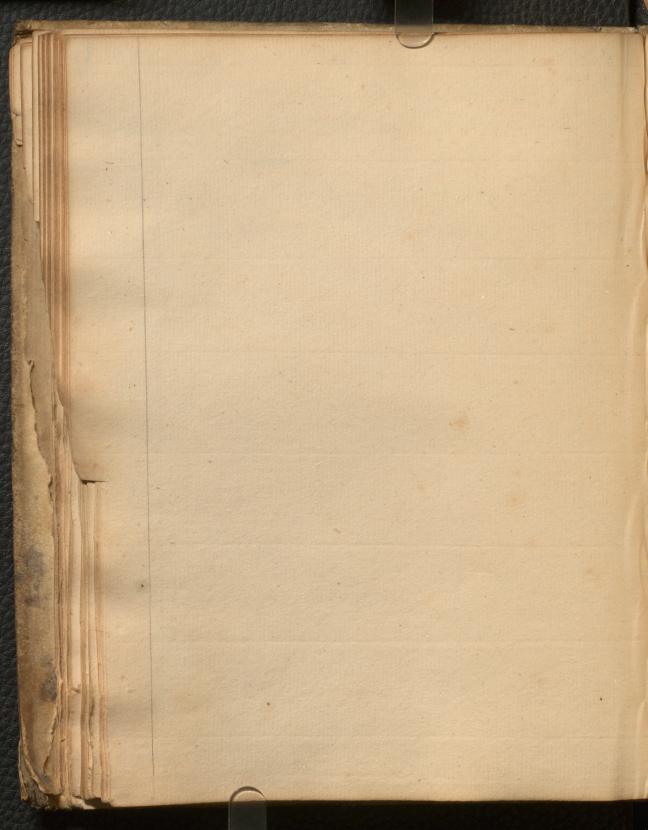


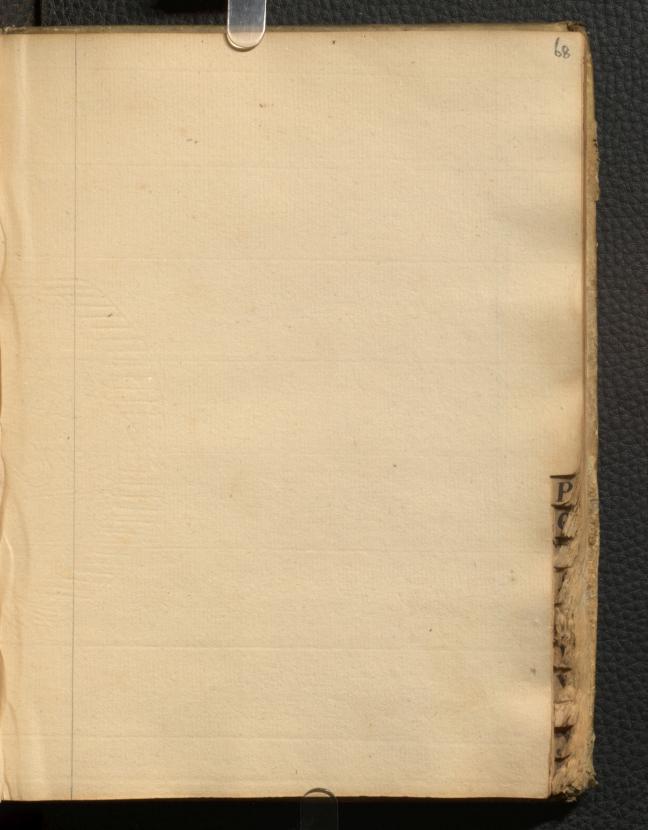


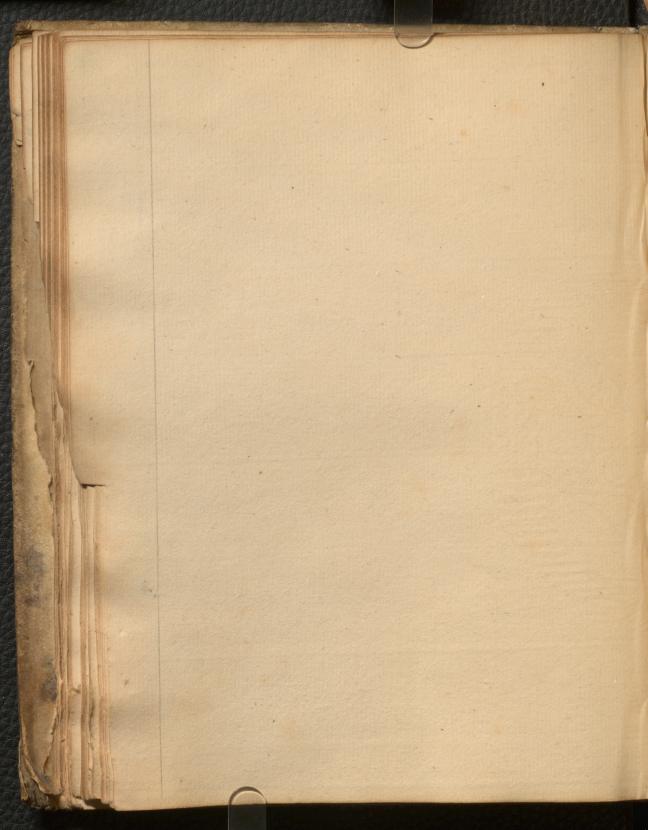
opacity see pages the 12 18th at the End of the Book. 66 Onb. to take the rail out of it take a piece of Lead & rerape tome of it Exceeding fine put it into the Byl & will pringitate the salt wit. Grange Tree's a new way of Grafting them v 988. Byl To make Linsced a drying Oil teo under Hatcate.

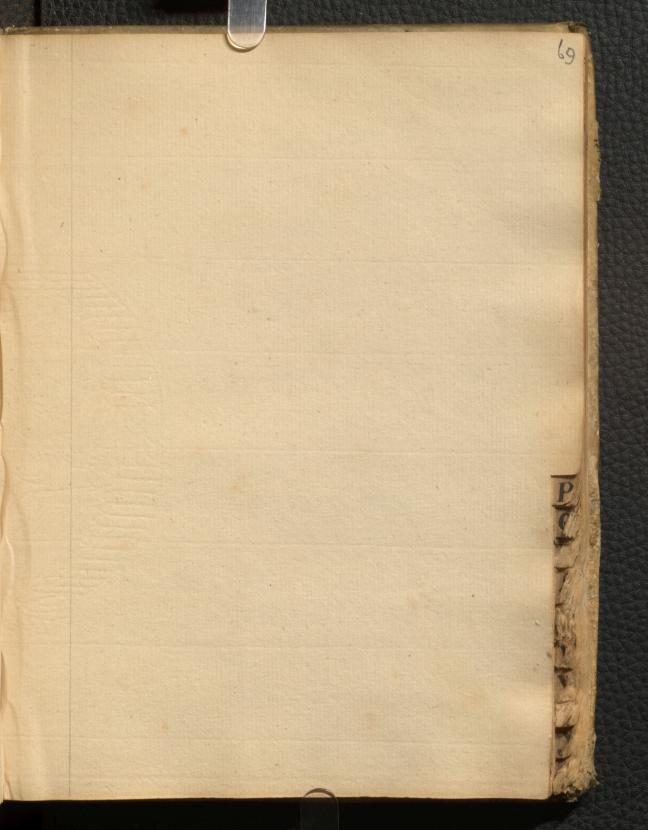


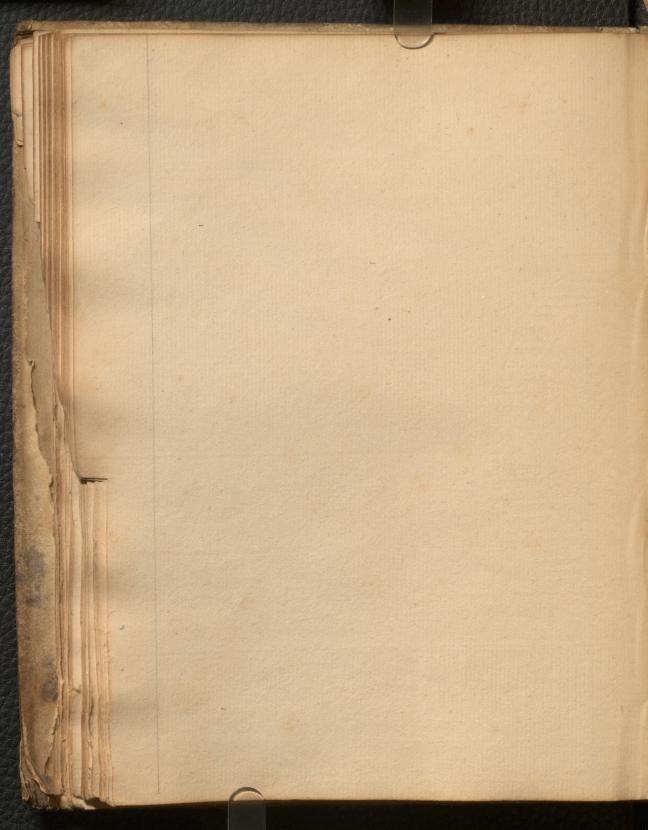


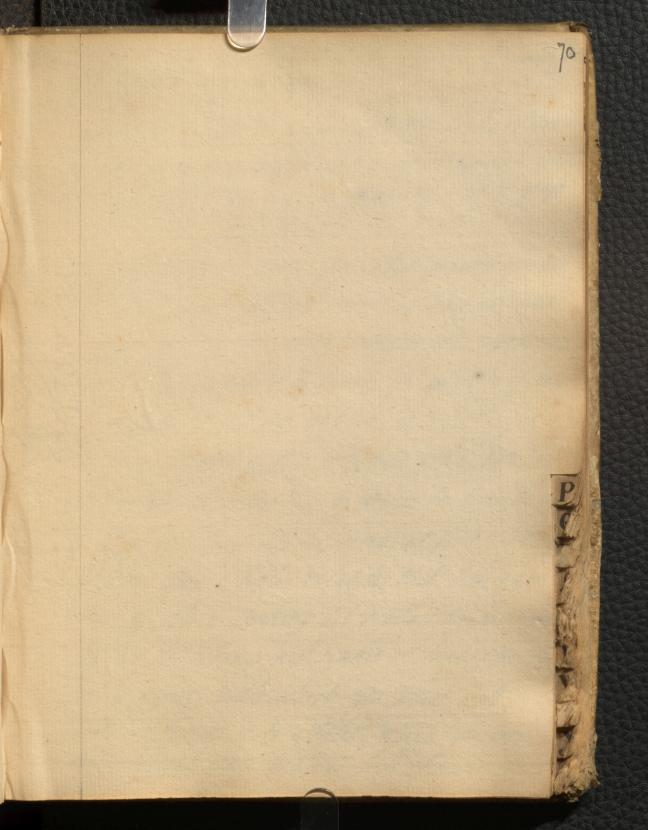


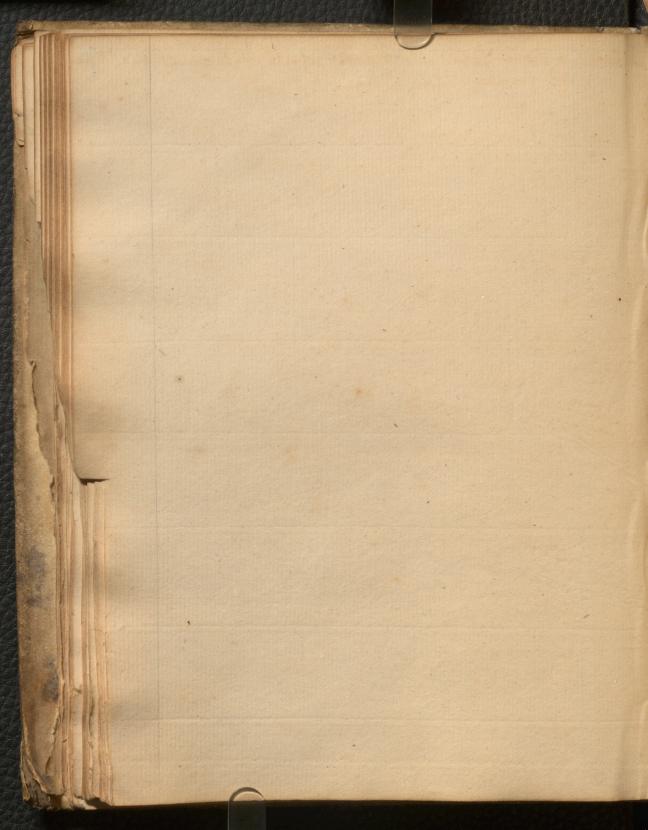












Bretexte a Robe Edged with Raylet which Children of Quality own till seventeen year of age. Parmesan see lotidi. artificial pearl as made with the scales of thest Gearl Bleak, which is made into a sort of varnish, which artificial being artificially layd on theads of wax or glass how made makes them look Exactly like pearls. Thosphoras Evaporate upon a gentle fire what quantity you will how made of fresh vine, till their remains a black substance Bolonga almost dry; let this rot for three or four months in a for another Cellar then mixit with double the quantity of Bole kind of Thoughtons ar menick, Is put the mixture on a gentle fire in by in own light. a stone Retort with a recipient will lusted & halfall of water. raise the fire by degrees for three thain & there will pup into the recipient first a little Thlegm, then a little volatile salt then a great deal of Black stinking Oil, & atlast the substance of the Thosphorus will remain sticking to the left in a white map which you must melt in water to reduce it to a Roler, which you may keep several years in a trail full of water close

Take of the Bolonian stone five or six great Thorphorus another way Hones pound two of them in a mother to a very to make it. fine Fowder & with that make a Crust round the other four, then put all in a little furnace upon a grate Cover them with Coal & Continue the fire for three or four hours, his done take out the stones & Clear them & your work is done Pontoons are Copper boats made for paping an army over a lunger River, the reason they fair is much weight is because the air they Contain way Tithe in Proportion to the water where Room Tendalu Mey Poseps.

Tendalu Mone of a string little less than 10 Inches from the made to point of its suspension to the Centre of the Buflet will swing half seconds with more Egin Than a good totatch. Do shows abrid: of his Boyles hor: Preservi Jugars preserve Fruits as common salt meats, by being with next which Contain them, hinder the fine particles of the Liquor from dividing those of the tolid body or the spring of the Internal air from breaking them.

the Brandy which carry the talk of the sugar into an Infinity of pores & sinks them like soman nedges not after to Extricato themselves) Either penetrates for Easily or does not sufficiently penetrate Certain Bodies to as to damage them. Dales Physi: bolt yer + 9266. Incipila tee at the End of the Book page you 8th Restility is the cause of the muladies of some plants giving too much Juice to their fruit they don't preserve Enough for nourishing themselves, accordingly trees to first are of les duration than others. Incisions are hurtful, & Even mortal to plants, if Hants one cuts the roots or strip them of their bark, or malaries otherwise break the good to that no more remain of them. but the bark; because in that case the sap can no longer Convey nourishment into the different parts of the plant. Frost which dilates the Truices, as it dilates water in repels as it breaks, tears apunder the fibers of plants, Clears the Trees sometimes & shivers them. Heat violently agreates the Juices & attenuates them. Them by the Except of agitation. The fibers being

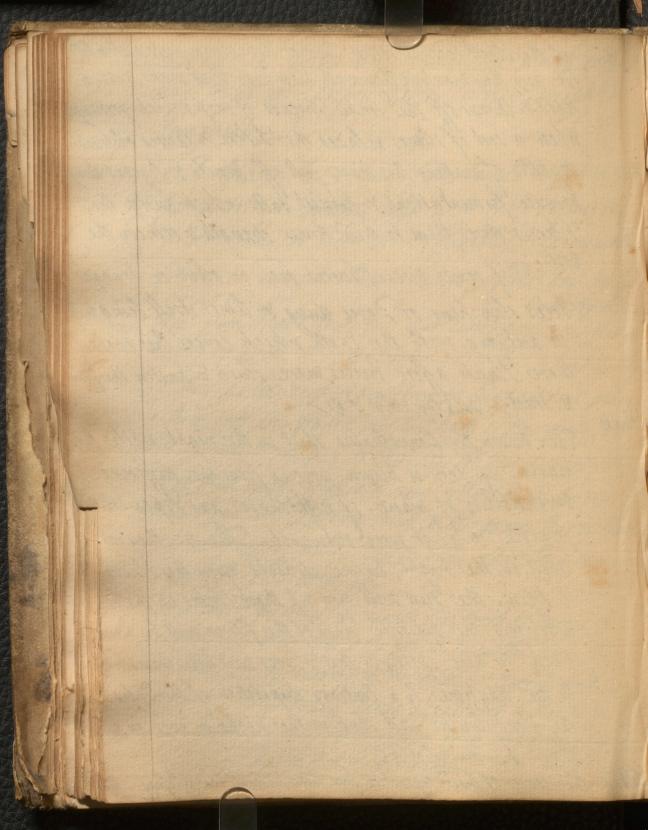
Clants are often a pray to Insects but their being huping Rated with Certain falts in sufficient to protect them, because Plants how those rath are hurtful to misech, whose fiber Mey har to present in Fieces. Boil in a paid of water, for half an Hour, Am them. Wormwood & Tobacco a handful of Each, prepout the water & water the plants three or four times with it when in Blotom, this is Enough to secure them from Caterpillers & Plack Flies, an inlaid floor being toaked with water in which one has mixed Corrosino sublim is inaccepible to Certain grorms, which otherwise wands Eat into it. Dales Thy: rol 9 9.68. Because the motion of the planet is retarded as it receeds from the sun, & is accellerated as it approach to the san the Hanch always describe Equal areas in Equal Times. see hotes on Dales Thy: 9303 vol3 4 see the Philosophy of them Jago yo 22 at the End of the Book. Frien . Acho it ribrates slower the neurer the Equator see Earth hofen Sendulu Semi may be accounted for hus. His reas mable to supporter that the water deching down the sides of soft stone Borrodes the minutest of the particles, it is supregnate by pulling shicks of rood into it ly the pover of about

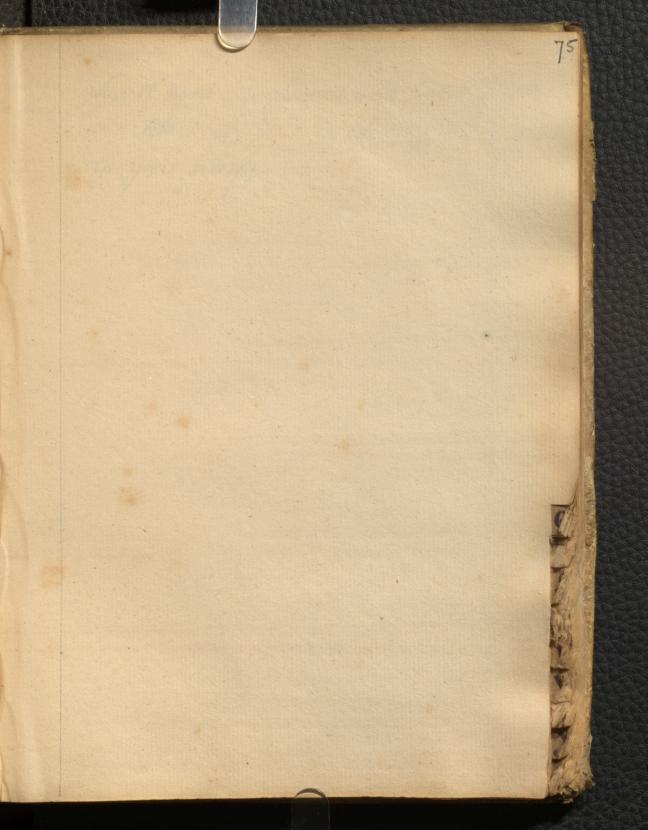
as we see some sinds of salt seperated from routes by the tiko means. how when these particles are to minute & tulkle, as to Intrude with the Rake into the pores of rood, in proceps of time, when it is throughly towned the Intenticus with the quite The with stony particles; & if anything agreeous remain, it is to well granded & Sucrustated, Egliere particles that it is not perceptable, nor to be acted upon by fire: but if the particles are not so minute as to senetrate the bores of the wood they only that dose to the But lide of it & coust it four hence me may gather the reasons why fountains welling some Tothe of wood througout is not their: & why some petrify the bark sap or to the part nother my Incapid Sebbles the causes of their seperation & Colours accounted for 9 30. water how to prepare it 9.63.

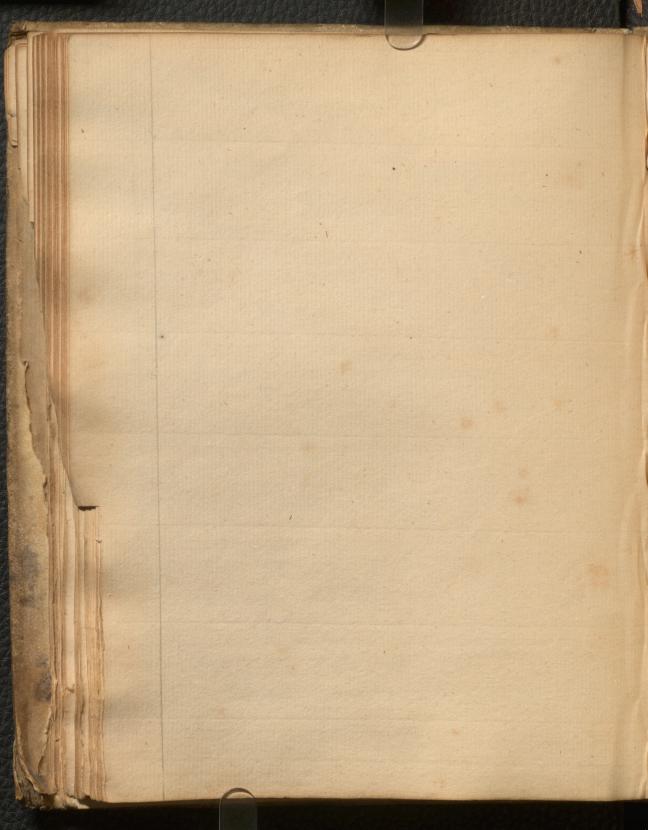
destitute of Juices are relaxed. The plants without any forces are preper down by their weight v. Langush. Hail bruises the Fibers of the leaves & Extravaster the nutritive fuices. rain with hail softnes the Fibers renders them more flexible, & Consequently fitter to Escape the biolence of the Hail by July Dales Hy: of 3. 749. The parasitical Plants are often more pericious than the Ripping of Insects. These are those which live only at the Expen of others, as the know & misletoo; for these are true plants, & their roots are grafted into the Bark of Thees, drain Frice out of them, & for them of their sap for their own nourishmen & by that means weaken, & often destroy them. The reeds of these Plants are Exceeding small, or the winds Convay them Cafrially upon walls, Hoofs or Trees where being favourably deposited they grow up, In cisions sometimes diminish the Except of Purces. for a remedy they move the Earth which Covers the Roots; they let in more air by moving it, or likewise lover it with dung. a greater abundance of Prices penetrates to the Roots; ofthe air makes it Enter by the action of its spring; to by that new they we the defect of the hires.

If the Roots become rotten, lows or Hogs dung puts a stop For lit. are they mouldy? they wash them with Clear water, which tears & Carrys off the small Threads of mos which grow up: When a sort of stime relaxes the Fibers, & Causes obstruction Capable of making the leaves fall off, mould & Tigeons dung produce fermentations to furnish falts which unstop the Fibers, restore them to their former strength & reinedy the Evil: if some viscons Paices render olive or Frange Trees slow hens or Doves dung, & timo itself being mik in autumn with the Earth which covers the roots of there Plants afford ruices more fluid & hasten the flower & Fruit - Dales Phy: vol. 3 9: 31 The reason the Convolvalus that in the night, while the marvel of Yern is Blown pricced from the different Extensibility of plants. if nightshade has tipes holive flexible, & as it were outwardly Cylindric, they will swell in the night, become straight, open the Hours & Blow. The sun will dry up those Tubes in the morning the opposite sides of the flower will be drawn tack by their spring to the Flowers will hide themselves In the day time. If a Contrary disposition of the Subis the Convulvalus will shut in the night & open in the Day. Jales Pay: vol. 90 9: 63 the Causes of their seperation from their harves beds & Cofairs

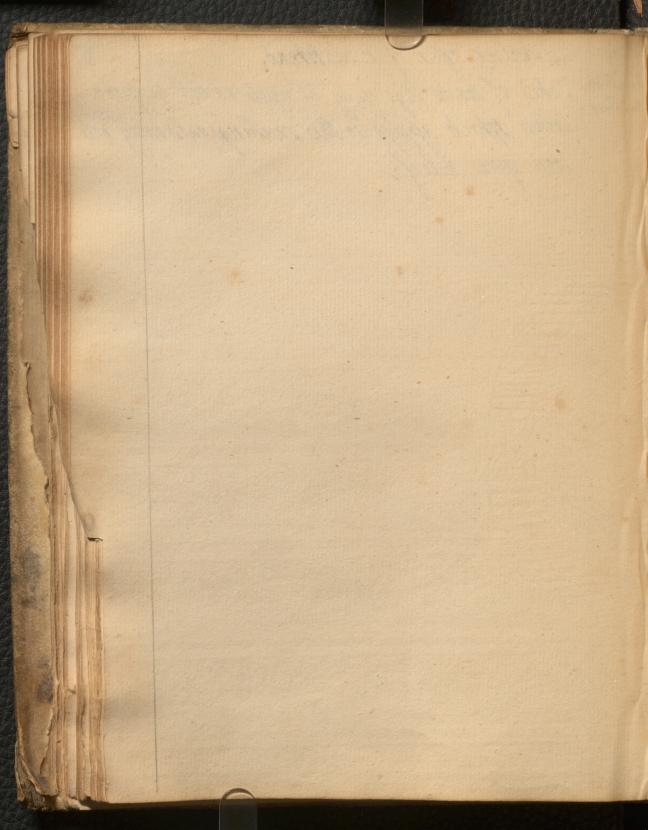
Hunds

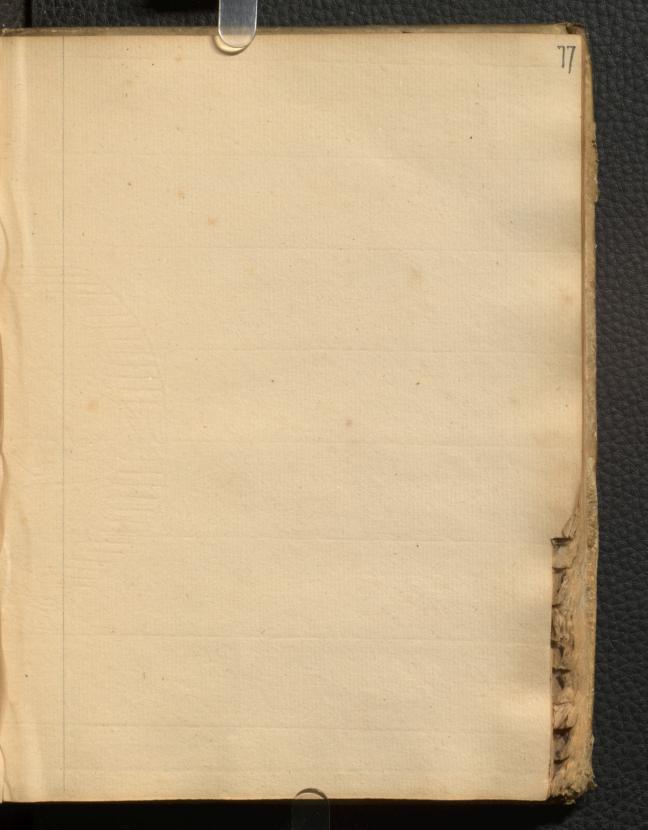


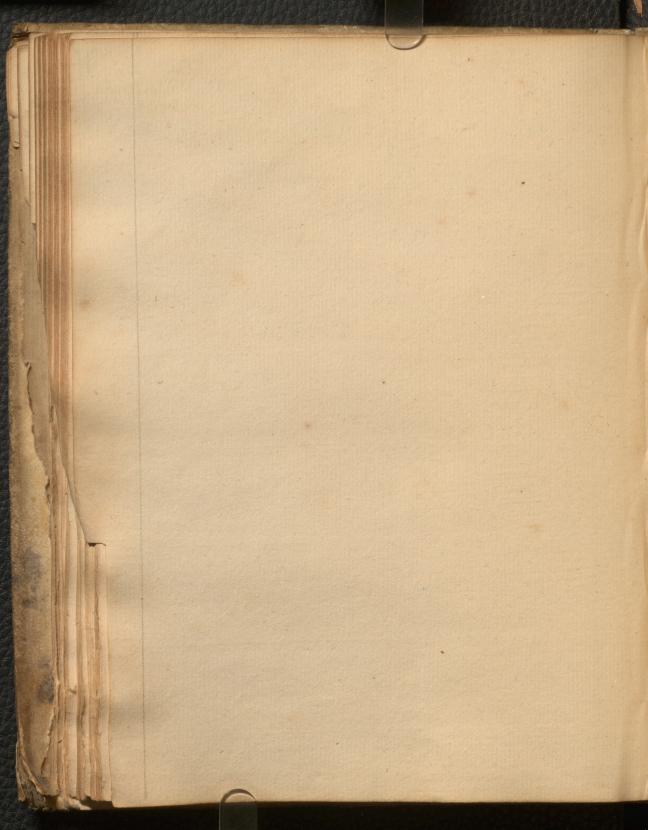


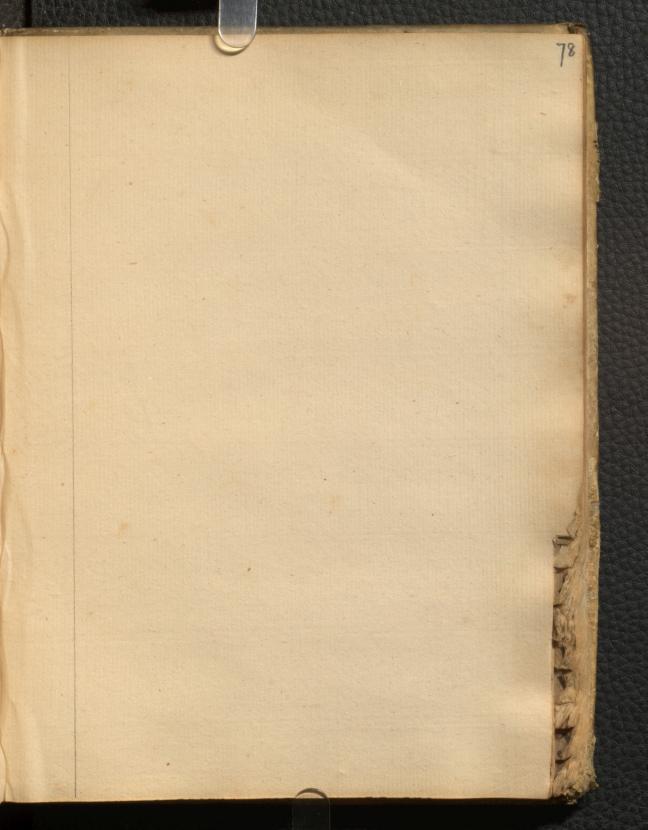


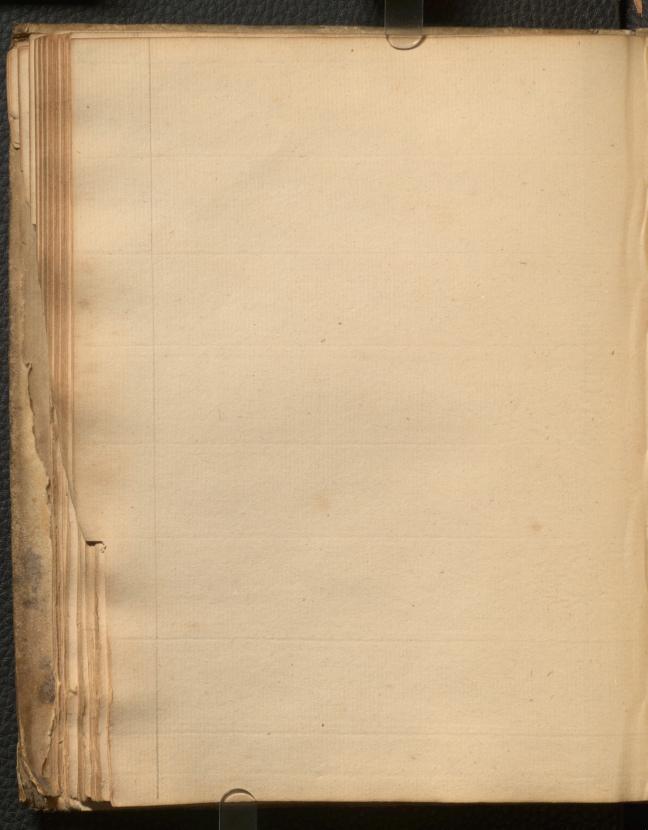
Quidsilver effect of it. see Bread. Take of warm Figs dung as much as will be upon a Grown which applyed to the swelling outwardly wa

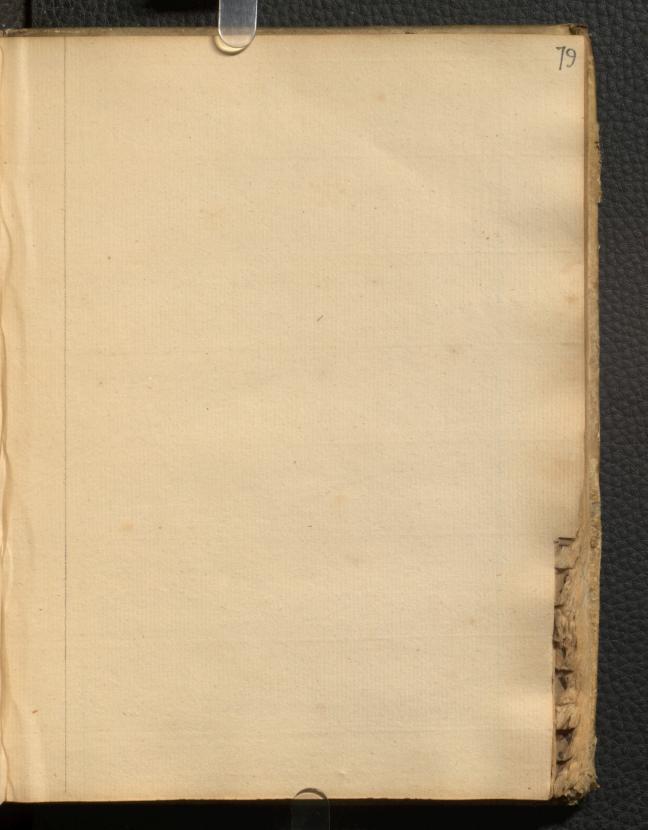


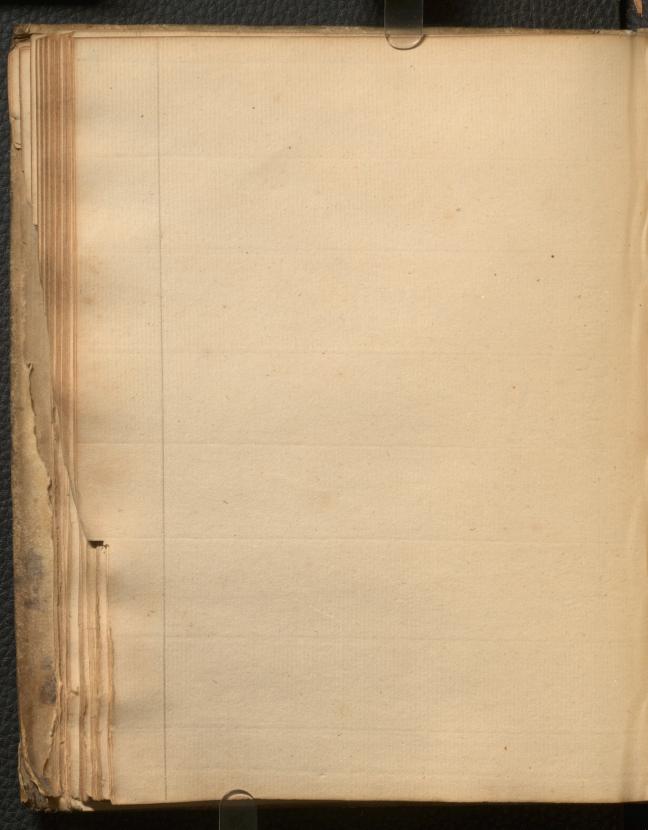


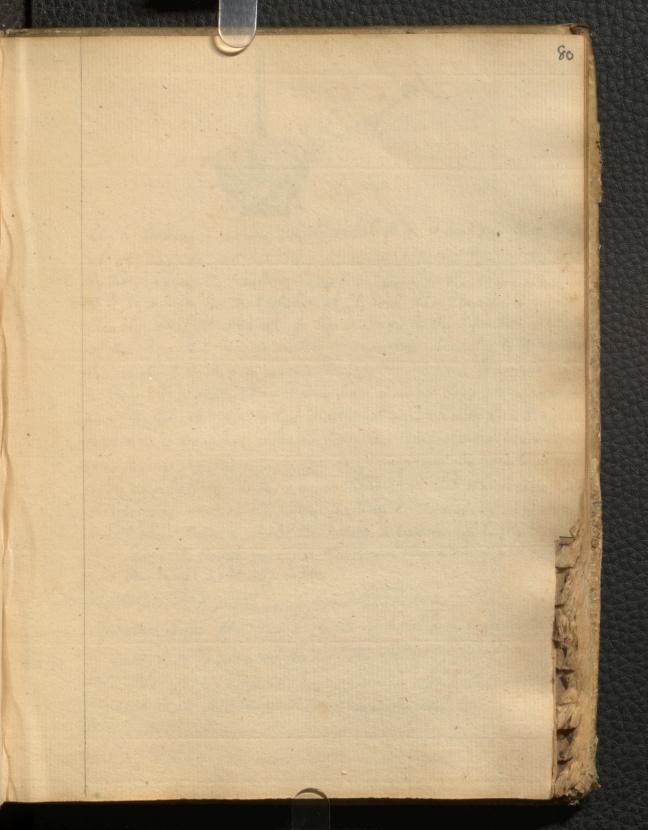


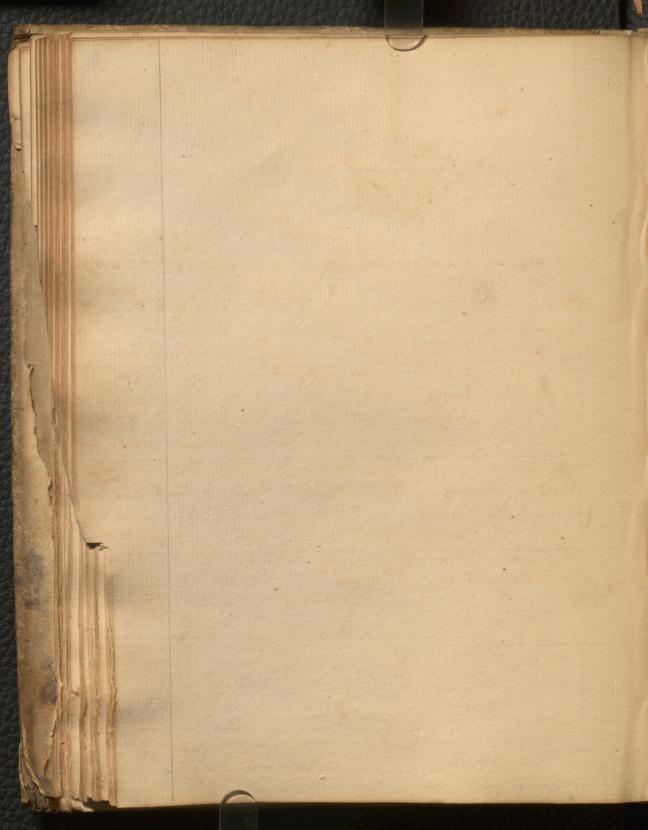


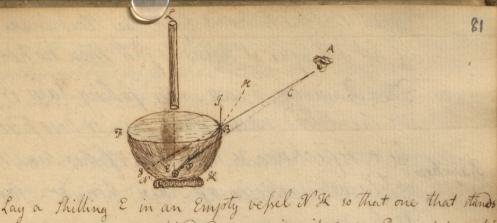












at of may be just hindred from seeing it by the Brim of the vepl B, then fiscing the shilling power water into the befiel as higher of B by which he that stands at ct, will then Perceive it very Clearly as if it was at g. this is Caused by the Refraction or binding of the Ray B & which instead of running directly to He makes the angle & B ct to so reaches the Eye A. from hence it appears that a Ray &B is refracted in Paping from a denser body into a vareras from Water into extir & that it doth not run directly from & to Hhat to of to so is somewhat inflected from the Persendicular line 9. Aray falling Tensendicularly from one Fransparent medium to an other suffer no refraction (as the aforementioned Ray did which came apoint obliquely, if you look upon the Philling & through a narrow & Per pendicular tube I whilst the honey & dyes in an Empty beful dis totally under it, though you fill the befill the shilling will seem just the same as it etid before

Rain preceeds primarily from the Vapours Exhailed the sun from the sea & Earth, which when Exhald is mixed or Condenced by the Agitation of the svinds

into their former substance of water, which being nature

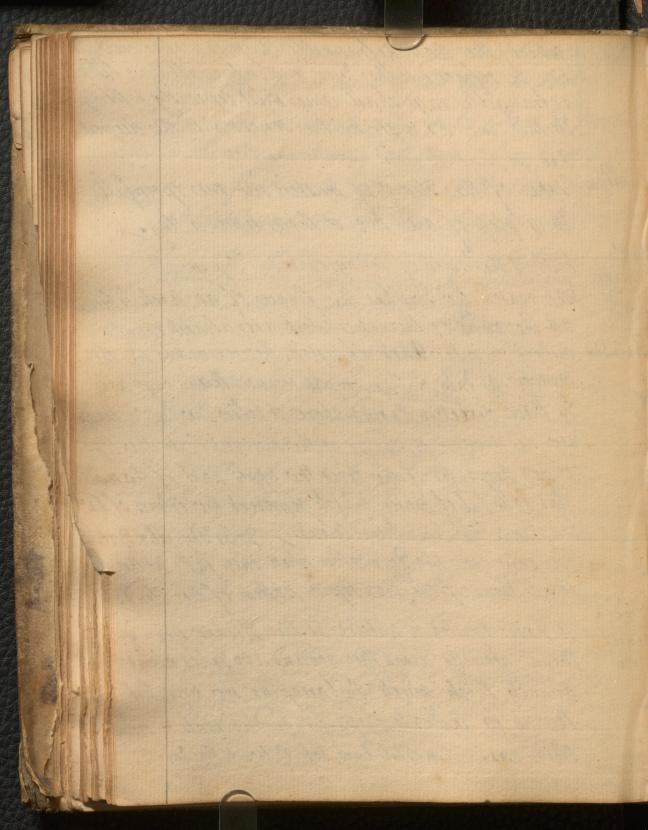
heavier than dir, must of necepity fall, which it would in great quantities were it not for the resistance

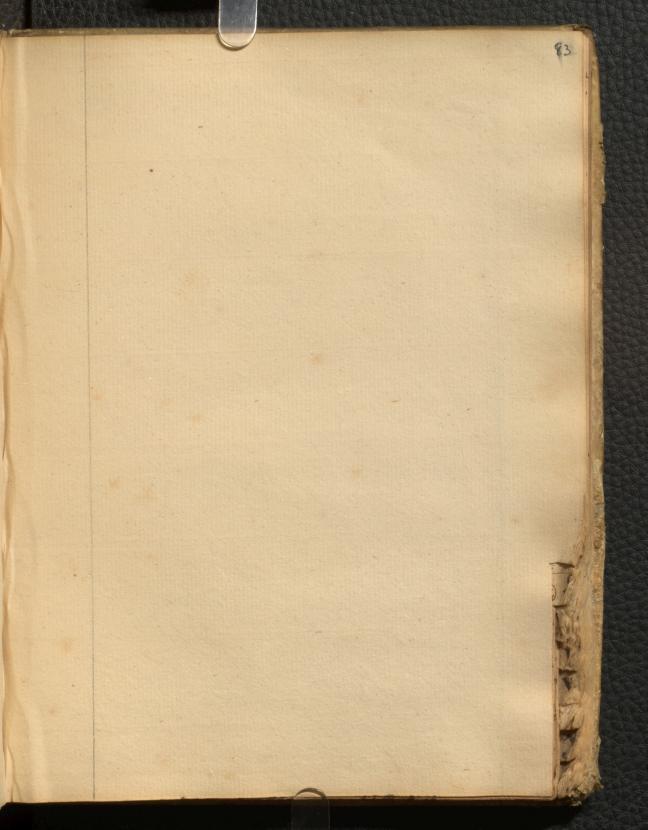
of the ainforther substance of the dir breakth it into parts smaller is smaller the farther it papes throughit. This when

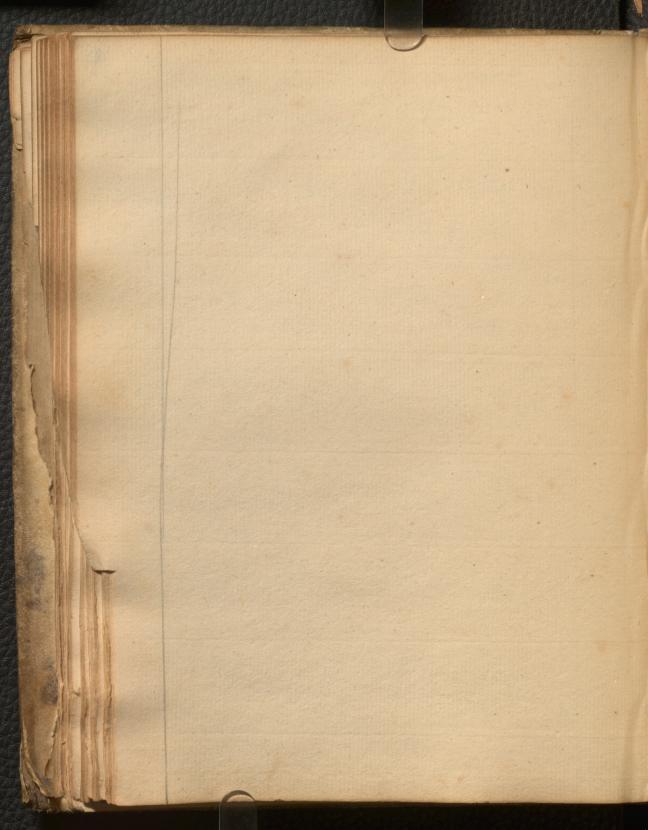
Rain

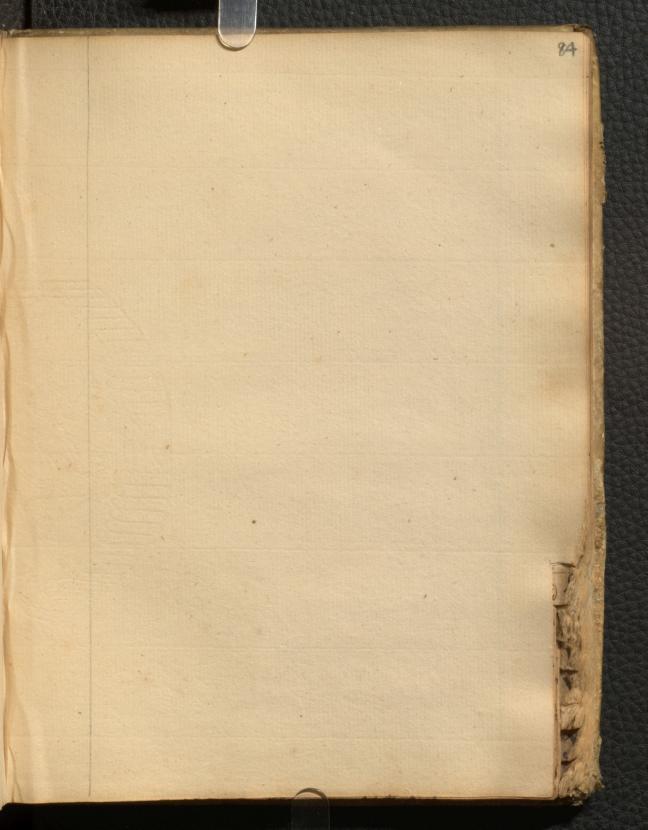
when the Gold Endences before the Cloud breaks we ball his if not till after it begins to fall then his hail. The Rain bow is seen in the falling Rain, or Dew & not in the Bloud, whence that rain or Dero proceeds, tis can by a reflectition & refraction of the suns rays fromthe globular particles of Rain; there are often two Bons which is more the same times. The interior as et Is which is more strong & Ewid; the Exterior how as 2 & D which is more faint & go Weak the Interior Bow is the of the Rays of light's one Reflection of them in the drops of water as thus described let & I be two drops of the falling Rain & let sa bear of light falling on the Brop Ein a, from whence it is refu first to e thence his flacted to E, whence his a second home refracted to the eye at o in like manner the same thing happens in the upper part of this tow, in the drops I. hence you may Easily undertand the reason of the coulour of the sow, for here you'ree the angle Gor that be the greatest angle, in which the most regrange Hays can after one reflection be refracted to the Eye & herefore all the direps in the line or shall send then refraugible Ray! most (jopiously to the Eye, & thereby in The Dences with the deepest rider Contour in that Region in the manner he angle Go? shall be the greakest in

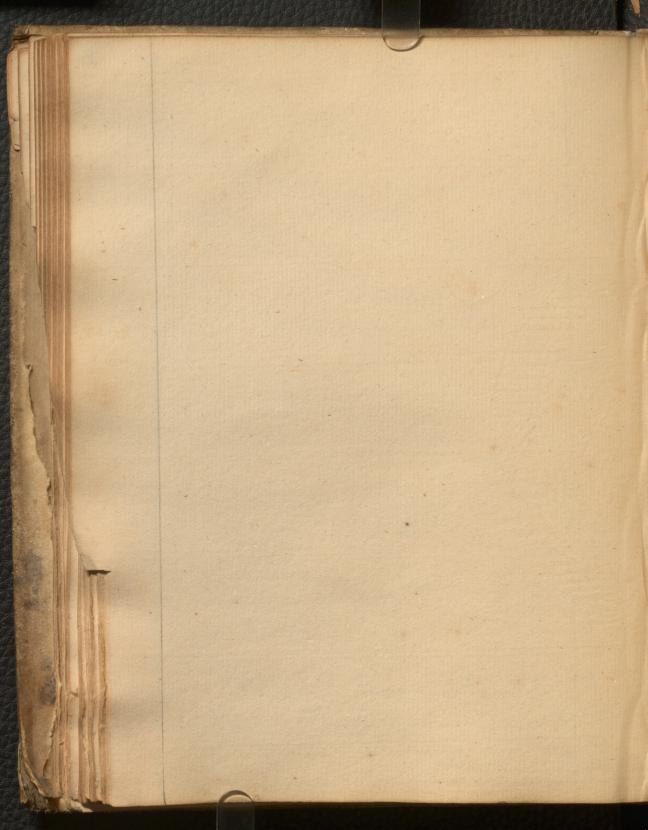
which the teast Refrangible Rays Can after one Refle tion be refracted to the Eye; & therefore all those least refrangible rays that comes most lopiously to the Exe In the Line of & strike the sences with the deepest Red in that Region. martin This grain. 9176 (135) Rumi Fism Take of the Flower of musters seed one spoonfull in a glass of ale two or three times a day. Battle hillo by the smell of Fennyroyal see Jage ye 1th Inake The reason the Iris has the figure of an arch is because all the rays of the same colour are almost Equally distant from the daily of vision. The reason we see the Rainboro ramboro as only a thin hoop is because themy rays are by their direction Carry above or below the Eye & therefor are not seen. The rays of the sun enter into the tops of the drops, for if one cover the upper part of the mall glas fall ful of water, which represent the colour of he Fris, hove falls love their Colours. Dales Phy: 107.30 9. 188. we only see two Rain bois when rain falls at the same time from the top & softon of the Elond. hope a a Rose twisted by nature is the Thicker hee in natural China growing along the ground 120 Papes about me an inch Mich much Subarraping we way fut serving for Cables to thips, for hundles reats & several Ther uses. see This trans: 806: 2 toward the End.

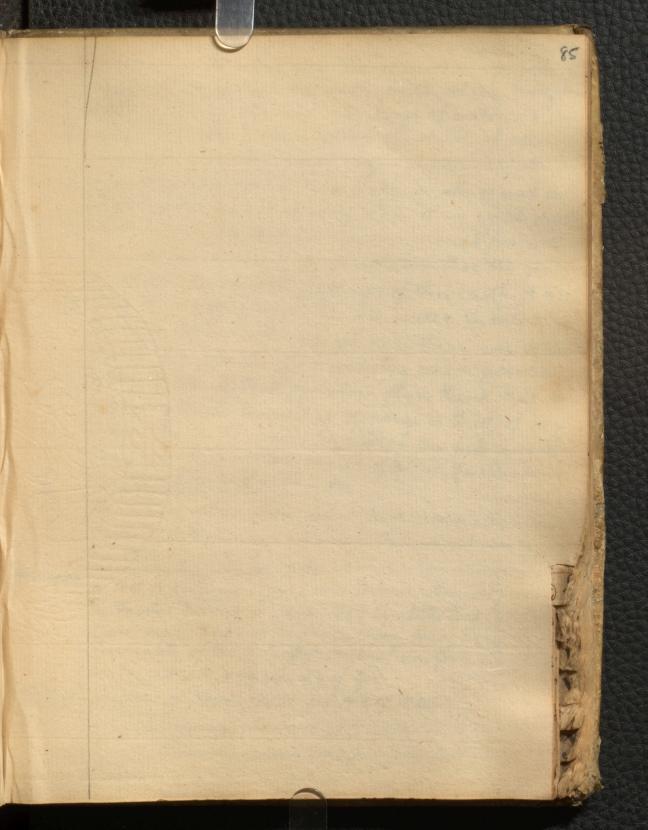


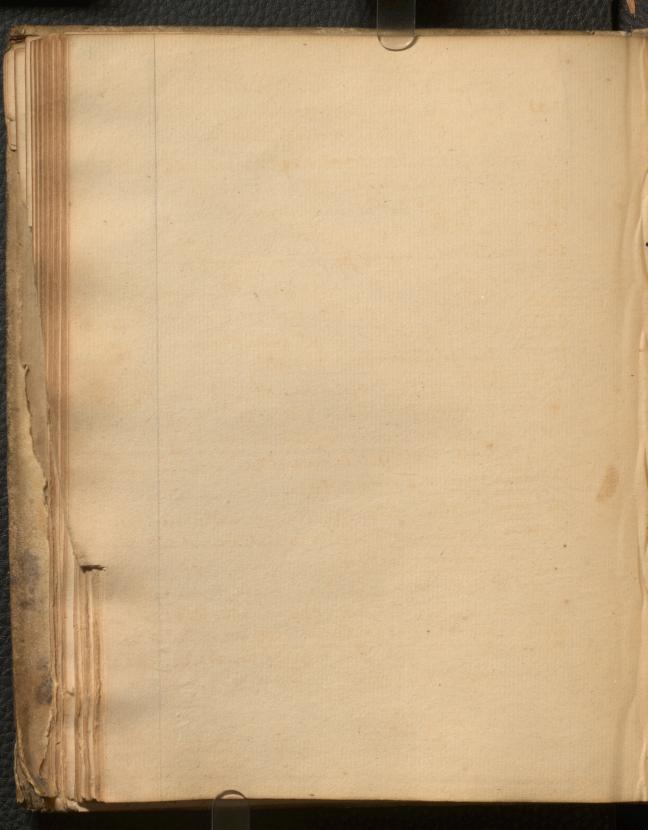












Springs of the causes of which men are of various opinions some imagine great caverns in the earth, which being very coals, condense the air into drops of water, & those being collected make a spring. others are of opinion they arise from the great alogse mentioned in the scrip tures, there seems indeed to be water in all or most parts If the earth but not at every place at an equal depth. most men think that all springs proceed from the sea wester dulcified by percolation thro the gravel or other Convenient passages of the carth it is not eary to imagine how the sea wester should rise to the tops of mountains, yet even there are often found sea plants often growing which persuade many of the truth of that opinion others think that the nater which furnishes springs is that of rains I now which in clouds hangiover the hills furnishthen cheifly with moistance seemore of this in the introduction to the atlas page ye 2° printed in 1830 1 ky The Azune colour of the sky for Isack newton attributes to vapours chryinning to convense, & that are not able to reflect the other Colours. Der: Th: 12 Socinians a lect so calle from one Latius Socinus. afterwards promoted By Favstus Socious at Siena 1888 he afterted that Christ was guere man, & had no Escistance before many. Denigo the Gersonality of the Holy Jost, Original sin, Grace, Predestinate the Sacraments, & Immensity of God. 1 gundron a body of howe from 100 to 200 men. Servant. of a tervant was discovered in a muster of Roman Freen he was Iresently thrown head long from the Tapeian Rock.

What we Call the fixed stars have a motion but is ware Itans the perceivable as not exceeding one degree in to year, & things to Compleat one Revolution of the Circle is required 25'920 years after this all the stars return to their former places. This period of time they call formerly the Hatonick year. The number of these his probable is next to Infinite; for with a good Telescope they appear Initions beyond millions, fell by their distances they Evade the sight by the best Instruments. by their mall nep of their appearances through, glapes, & the different digrees there of, the astronomers, I magine them not only as far distant from Each other as from our sun. but also that Each fixed star is and Jan surrounded by a system of Planets & Comets, & those again furnished with different humbes of hom like those in our own Jolar system. This Hypothesis depen on divers astronomical observations: we may also reason thus; our sun thineth by its own native light, to do these stars ergo, they are sun's: the sun at the distance of a fiscustar would appear no larger than a star ergose. none of our planes at that distance would be seen at all; ergo ac nothing is made tis well known how stars appear & disappear after Certain Intervals; what Can this be, but the almightes hand working ole, is Erecting new system's of worlds. such in outterly was theo tase of our world, & Slanatory System, in the mosaick Gest

our sun sust made, would have been a new fixet stars Tome of our Bornets also may there appear new stars, when in their aphelia, but in their return to their perihelia disappear again: thus also some of our new stars may be 8 dou biles are Comets (belonging to some sun) in his whost Excursions, which upon their return desappear again: these new & Exchinquished stars, are generally in the milky way, because there parts are replenished with a far greater humber of sons, & therefore have on Course, more frequent Becasions of these The nomena. Tome people Imagine that springs arise from the sea water which leaves its talks on the sands kneath from whenay draining through them, & then percolating throng some Imaginthe pores of the Earth, is raised by degrees to the top of it by some Certain power of attraction, & that both Sand & other terrestial matter has a power of attache water, appears to be very tertain from putting a lung of Ingar into a little water through the pores of which the water will quickly ascend to the top or what is still more to the purpose a little water point at the bottom of a sand heap, will ascend into the mid le or perhaps near the top of the heap, this they say seems a first representation of what the seas the mountains are with regard to Each other? & this is

indeed the most plausible objection that an be started, and in their true Cause. But to this it is answered that in the first place, neither the sands nor the Earth have that attractive quality which one might Imagine them to haber; for the cause of the waters rising in them is owing to the External presure of the air, which forces it up ents poins Bodies, in which the groper parts of the air Cannot act with free power but this Elivation of water is only to a Certain height; for it has been found by freequent Experiments made by Emerging a hubo, fill with hand or Earth well dries, in water that the water in some rises to the height of Eighteen, in others to the height of 32 feet & never higher, be twist which & the height of most mountains there is little or no proportion. Her the sea water blocks-up its own papage, through the sand & the Earth by a sort of glutinous substance the ad that Covers the Bottom of it see more of this in ye 3 old hat gisp wages of its First the smalest particles of sea salt are Exhalle togather with the vapour, carried all over the Earth by the winds & become one of the grand I rinciples of begitation. secondly those grains of salt that are more groß & heavy resist the action of the sun & air in ranfying the heatens, & there by fixing the means of Enzouration; for the particles of the falt & water

being retined & Incorporated with Each other, are so neither so Easy nor so quickly seperated; & the more these salines particles are that obstruct the ranging power of the heat & the air, the fower aqueous par -ficles are raised by them in bapours; it is the Salt her fore which by making the water specifically heaving Inoderates the quantity of Exhailed vapour, & louse quently we are obliged for that Just proportion of fresh water which the sun Causes to Evaporate from the sea for our use; for were it not forthe resistance it meets with from these particles of lat, it would raise from the sea a quantity of various sufficient to drown the Earth, instead of making it Fruitful.

tea Plants the teason of four growing out marks.

descending directly through them from the top to the Root; the weeter on the other hand lauses the loral & other sea plants, to grow in a Contrary direction down from its vant, by arcending through its prompt the to the root it seems odd to Conceive how the sea plants can be nourished a grow without the apistance of the Earth, for they all most all have no roots but a flat botom, by which they stick to some stone thell or siece of wood. but this elipically will lambed attely earnish if we consider that as our land plants are made to this on those mices which permeater

the pores of the Earth, or fluctuate in the atmosphere, they are accordingly provided with roots, Fibers & Capillary befsels, to attract the water which is under ground & also with branches & teaves to Imbibe the moisture that is in the air. whereas the sea Hunts, which find in the Water a sufficient quantity of salt, oil, & such spiris Filver how as are hecepary for their regitation, have no boiler Sec Colours. occasion for roots to feed them with a supply of Juices from under the ground. hate Dis 9197. Salt the that it Contains Busbles of air, which being Reason of rarified by the heat hurst their alls is give a in the fire. of motion it does bonsequently help disgestion of Inotion, it does Consequently help disgistion Better. hat Dis: Ul:3 9.261. Tytha goras is Said to have been the first Inventor of cus's. This Tystim which was restored about the beginning of the Fifteenth Centuary by Copernicus a Gannon of Fourais is on that account Callo by his hame. That low The attraction of meeter is not only Evident from water oy weder. Quiesilver but from Eaven have Bodys as tuctals by heat reduced

to fluction, this is manifest from the making of short The way of doing which, is by running he helks Tead through a lade ful of Holes into Colo water in doing which they take care, their Lead be not bo hot, because the globules would then by to pieces; nor too Cold, because it would then be long & have Tails, but in a due Temper it runs round. Key put orpin into it when they melt is prepare it for shot gurhand see Colours. sublimate Correive see I. 16 at the End of his book. tublimates. salt spirit ofit If they larry off with them talts, acids & alkalies fit for fermenting them together they heat in the fermentation. If they are Cold above & hot beneath, the fine & agitated parts are Easily dipipated in the springs air & those of the Bottom being stopped by the upon mineral parts unite their forces again to by that means produces the that agitation which is the tauxe of heat. If cause of they are Colo in the Day & hot at hight it may, proceed from the hear of the day reneving rendring the Sapours & Exhalation too fine thereby dispipating them too much to laure any tensible ago them & ho puts them into Sond this fit for insteing the brains of

of sence with a sufficient violence to cause in Them a sensation of heat. if they Encounterin Jeomson the water one their Course with places full of sulphur or Bihuman Jeo 9: Rg. They abound with those spirit which rise & hover over the surface of the fountain which are very Easely kindled by the frame of a Cambe If these waters being carryo to another place do not Catch fires tis because the sulphurious part is Exhaled & dispipated by the agitation of the Carriage: Dales Thys: bol. 2 9124 Aar fish see 9:39. Of their heat see Asi mineral Waters. Heep is Caused through a want of animal spints or Jan Regitation in them. accordingly fatigue which Exhaust them, Contributes to sleep; to Opium which retards their Steep Instion by the Colones of its parts, produces the samo for Sow laure & if the dose to too strong one never awakes because it Echiquishes the heat of the Blood, & in Consequence that of the spirits. Sleep often Ensues upon a meal. the Blood being thickned by new Chife, which is not yes sufficiently digested, no longer furnishes the Brain with animal spirits; or those It does furnish are too grop to flow into the Organs of the sences. Esides, Inflating the

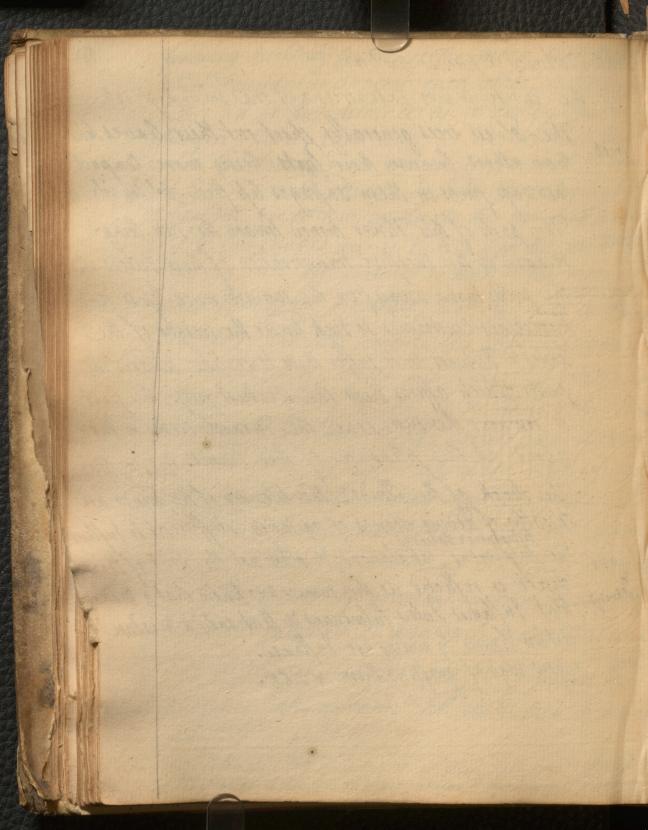
Blood refels it Comprepes & Closes the filter of the spirits no more lively Imprepions are made hence proceeds Huep. fat Tersons are more subject to it because their Blood which abounds with oily & groß parts Clous up the Conduits of the spirits; or that being left agitate since they have realy the pulse slower, it sends to the Brain grover spirit, or in lep quantity. The approplease is a kind of theep caused by the supprepion of the spirits which are too grop, or which finding the papages theodeked up or stopped, lannot flow into the organs of sence. Fumes of wine; spirit of winer. Certain perfumes lause fleep for the rarefaction which They cause in the Blood, fills, swells & Enlarges the Blood Topels. The dilatation of the repels propes & Encloses the Canals & filter of the spirits. but if there Canals are not thereby closed, Certain viscous Kumoun Carried into them fermentation stop them up. 9208:01 Phles thy: vol. 2. The murmur of a Rivulet Causes steep by Entirely altracting the attention & the uniformity of the murining rendering the motion of the spirits uniform, there are no changes or varieties of Empresions. The reason the flep. head nods first on one nos then on the other is because before thep there are no animal spirit, which keep the herves Eaten he reason of

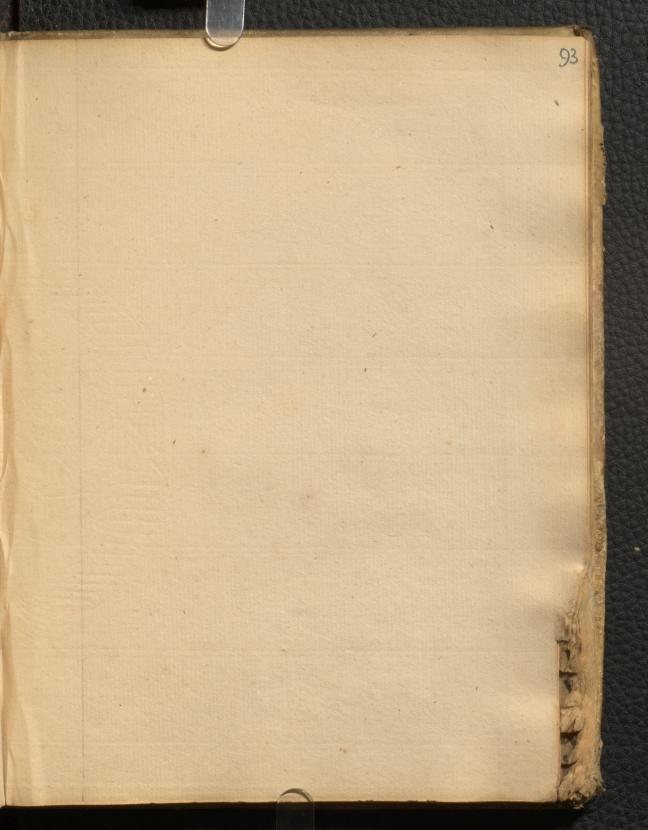
to give a due firmoup to the members of the body. Cabour make men sleep because the spirit hereby freing I 210 being dispipated become defectives. why they sleep the winter see Sage ye gth Tounds of Every kind are more or less strong according ask reflection is more or lep lively. Tensitive Plant see Page ye 18th & more fully 9.36th Sallet to raise one in 24 Hours see Page ye 20 th Thells foundin marble accounted for 9:29. Springs many qualities of them Explained see 922 at the End of this Book Ten water why it does not freeze so soon as fresh. Is why it seems hoots rever thining in a storm at night see water. Toution's at of sugar latt xe seem to be accounted for from the Jugar se Greater attraction between the particles of the Jugar's my solling see than between the particles of Jugar's suyar. Lec microscopical of J: 4 52. Grero: 17 86 6 mark Talk y Figures not determinable see Frener y letter sis continued. rawbernie ut 2 %. esping of the of a tho and things seem to be takent in y dir ready to produce now canted. of kind whenever they light on a proger matrix. The tear of mohet muterooms secy 13th are conceald & welfted about in gair. There is every where a cid to corrode metal, Minhy to seed to engenderly whole atmosphere seems alive. From will ruth & ansmal ones mole grow in all greaces. Triong in Earth becomes fertile & crops of new plants Ever & anon shew them selves. all which proves y air to be a common semmeny wall virifying paincipoles. Coursed see bapor tolies popular to to of Jarticles Compiled & under Elosheity.

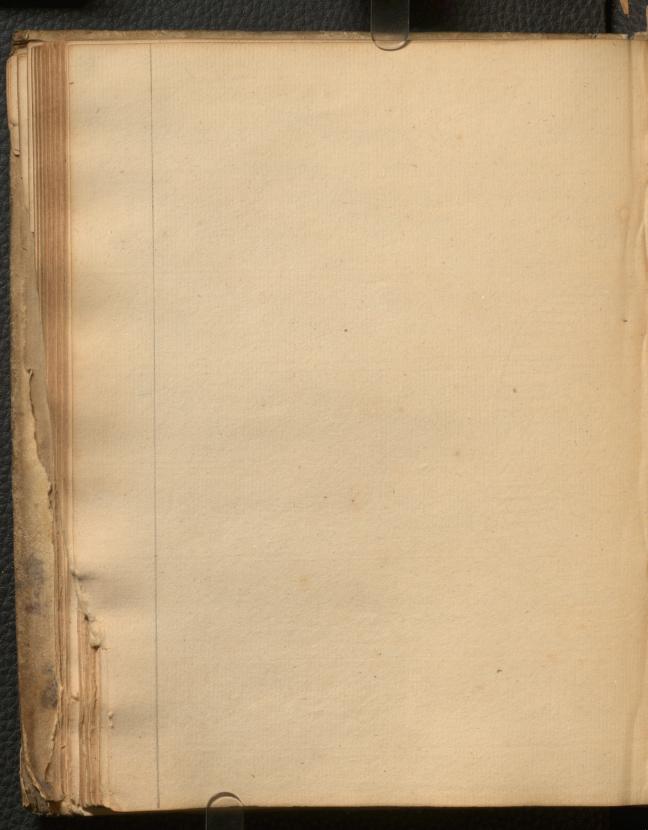
was like a major in one of our Regiments. for it was! Irihune his Duty to see the lothier Exercised, & well disciplined & to altend the Consul for Orders, who was a general. It is now verywell known that the hoes are caused by Tides the the attraction of the moon is sometimes encreased by manner of the attraction of the sun conspiring there with, as in Keir Elling Conjunctions, or newmoons, & those we call spring he "flowing sometimes the suns attraction acts Counter to the moons, as in the quadratures, & then the Fides are lessened, & are what we call neap hoes, which may be Illustrated in this manner. Suppose o. the Earth surrounded by water pon, m the moon in Conjunction with, 80 in opposition to the sun in s, 8 in her from the sun in 2: now it is plainted of the Ocean I, to which the moon more than pendicular, will gravitate to the moon more than any other parts of the Hemispheres on & therefore the Water in that part not become lighter than usual, & so will turnify & rise up to water the moon. on the contrary the grater in N, being most remote from the me m will be less attracted & gravitate less towards the than any other parts of the land or see in the hemispe ENn; & therefore will keep at farthest distance from the moon, or, which is the same thing it becomes lighter han wan, & tumfies on the part N Contrary to the mooning bu this me cons her becan must of hecepty Conform they to an oval figure, whose long est clameter is 9 N she Thorber & n, now because the Tides at I'm are Existant has at the same time to conte to Each other it is evident her

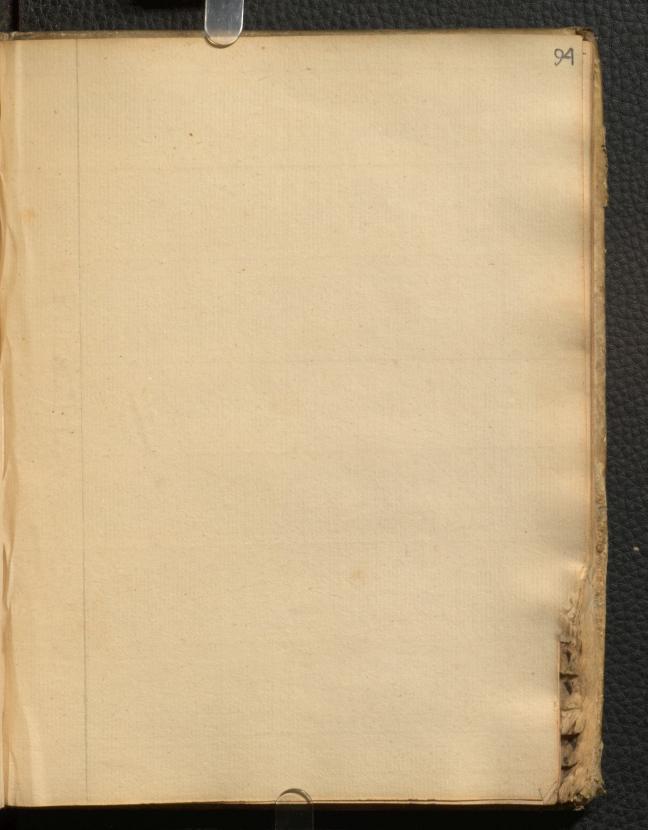
following the Daily Courses of the moon, that they must Constantly succeed Each other under Every meridian at the distance of 12 Howers home & therefore twice Each day as we see they do. when the sun & moon dre in conjunction the water at 9 x N will be attracted by these powers Sointly but when the snoon is in square to the sun, that is now those luminaries are in In & 2. Then the power of the sun in 2 acts Contrary to that of the moon in me some Philosophers maintain, that the moon as it papers over over seas does produce this Effect by Comprehing the atmosphere which hier betwint it & the ceean & that the Body of the air by its Elastic power the vouring to Esepand it self, preper upon the water & by the force of that impression makes it him upon the land. others deny that the prepure of the moon, by the mediation of the atmosphere, has any Thave in producing this Effect, but uson's it to the power of gravitation, or a tendancy of The Earth & waters to approach nearer the moon. renced may be reduced to a fine powder by putting the and alleblaster into a flame till sed to then Casting is into told water? Tartar sees Colours. salt of Fartar is an acid falt drawn from Tark

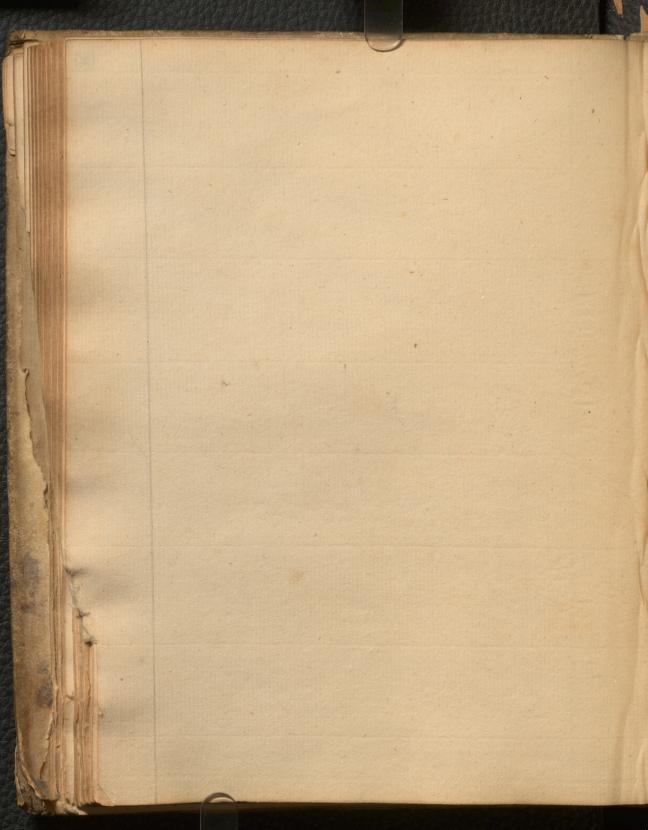
Tickling whence it proceeds tee 9:10.1 Tree the Ensete a very Extraordinary one se Sage ye 19th The oldest trees generally shoot out their leaves laker than others, because their lasts being more compact The sap finds in them Sapages left free. Dol. Thy: vol3 9.37 The parts of this Hower turned toward the sun, being Turnsol relaxed by the Exceptive transpiration of their fuices, while the pasts turno away from the sun are much lep is find Themselves Constrained to sink under the weight of the leaves & Flowers, to to suffer them to Incline privards the parts which affords them the weakest prop, his part is towards the sun. hence the Turnsol seems to him about at the pleasure of this Hanet gales Phy: 8013.9.62 The thock of the Glowds & the Blowing of the winds are Capable of adding degrees of agitation inflicient to Influence the interpress & saline the my not the heat of the my Thunder direct or reflected do the same. we know that a modera lightning heat Inflames Julois fulminans & that only a minture Certain Liquors by mixing are Inflamed. grees. a new way of grafting them. v 9.63.

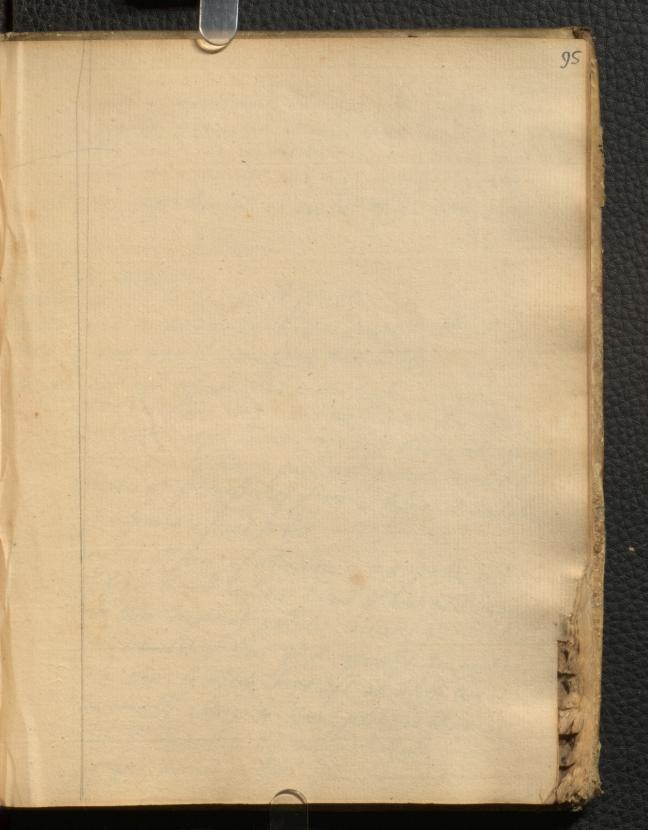


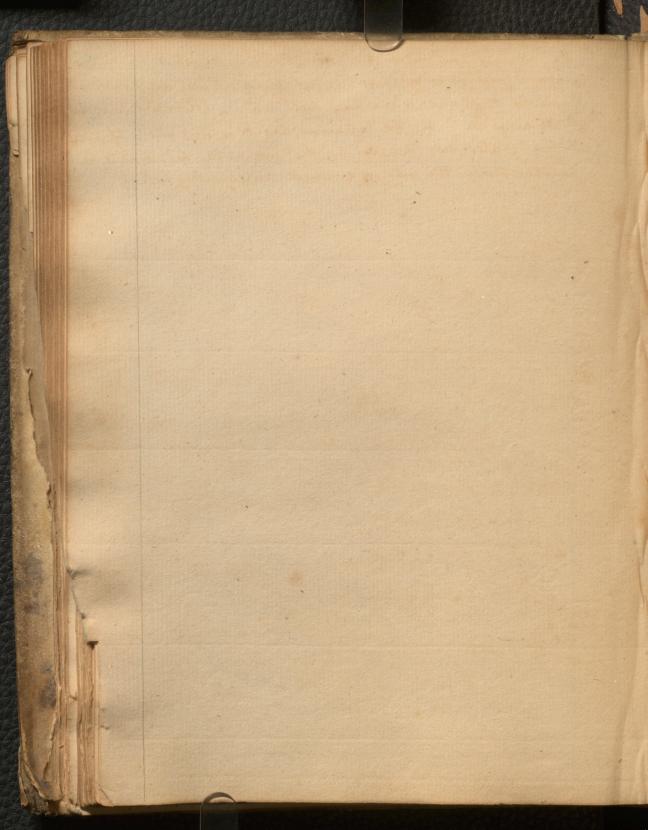












the manner how bopours a precipitated by the cold, or reduced hite l'apours see Cold drops I conceive to be this; bapour being nothing else than infla besicule of water; when they meet with a colder our than what is contained in them, the Contained air is reduced into a lef space & the water case rendered by that means thicker, so at to be heavier than the air, & so must consequently fall. Vitriob see page the 18th at the End of this Book. Venus's hair Lew milden. Bolanos. Jee Earthquakes. Segeration promoted by toak fee 9. 4038h Regetable was or mummy how made & its uses. 9: 33th Vines a new way of mannaging them 9: 63. Vapor how raised from different brois raciting smell.
When bodies are divided their surfaces are then known to beam much greater ar for Instance any body divided into 2 parts of Surfaces then of there 2 parts will Evidently to rence become greater up ye surface of you whole before it was divided. us difference is found to be so at as ye force of attraction is in proportion only to of Suffer of bodies it will be hence Evident at heat as it reperates bod into their Component particles increases y attraction of particles wat of time of it represales the particles from Each other, by which being left at liberty they must Consequently adhere to those particles which attract Them you strongest. 85 this we find Evidently to be your Gets of smell must be volatile themise they cannot be applied to the spillar

75-31 fol. 97, line 10. showed me Who was me?

Protogramme Come now to mention those Injects which are alway ? perfect state as the Beetle & water scorpion which are pretty much the same in the outward structure of their are very different from all other kinds of Insect having their leas which are very long placed about the middles Fires their Fodies, which serve at dars to row hem. The shape of their Gody is like a Common whency tis observate that this Insect always swims upon its back. In Descartes once showd me many of this tribe in a drop of water, wherein leather had been steeped to small that the double microscope did not make them appear half an Inch long, & Irusped they are Insects only in the hympha state. next follows the water Insects, as they are the greatest The Gnats part of their time in the waters. The number of their wings are not always Constant some kinds have 4 aprice others but two. The bellies of the famale the not Impregnated are larger than those of the mate. Durham in his Thys theolog tell us larger sort of gnats lay their Eggs in medows ande the grafs, & there is one of the middle sort which tags the Eags in beer reast. Fut all the rest, which he had lay & hatch in the waters. The Grat which lays in be hatches some time after into maygots which are so humerous that the liquor stireth of it was alive. in which were observable some larger some smaller the larger are the ofspring of our heat the others of a small dark Colourd Planning to red it to frequent in Clark

60 all these maggots turn to aurelia, the larger of a Jan Colour him to Gnate which are of the unarmed kino having no spear in its mouth, it head is larger than that of other Grats, a longer heck, short Tointed autin Strottes wings of a brown Colour. The water Gnats lay their spawn about an inch long. Is half a quater of an inch diameter, which floats, but when the Eggs by the warmth of the run are hatched who magots, they descend to the bottom, where they make themselves little cases, which they creep into to out at pleasure, until they are arrived to a more man hympha State, & can swim about to seek their food they are then a kind of red worm about half an Inch long; it then Enters into its aurelia state to from thence proceed to its mature state, all as differen as to shape & Accontraments, as if the Insect was 3 different Animals. Tis this same kind of Grat in their nympha state, which has often given decksion to Ignorant Yeople to support that some waters were furned into Blood for Shaw Seen ponds & ditches about mid summer whose boaters appeared of that Colour, having all their Bottom's Covered with these creatures in their virmicules state which disapear for some yards by fonching one or two of them, but creep again out of their lells or cases

in a minute or two. some of this kind as well as the 61 Cramp spider, are able to walk or Fand upon the wellow The wings of these creatures to almost Every other Insect Expand themselves in a few minutes after they are Extended from the Chrysalis but not at that Instant Thave observed, at the first appearance of the moth or fly that their wings were only beginning to bud, but have unfolded them selves to their full state some on less than two minutes & others in 3 at most which is a kind of regetation more speedy than has get been observed. if we consider that the Expanding of the whole wing of the butterfly is but about 3 mining the feathering which is then perfect must be almost Instantaneous. I have observed some of the smaller Kind of Grats which have not lived above 8 hours after taking wing, having taken them when Just exche The Thry ralis & kept them under a Canvas case. generall lay Eggs which hatch into muggets, that affirman Thier lay them selves up in Rurelia to from Thence Change in Flies. But there is one kind of flies which asemble to & hang to one another in so great a number as to make I tump or fall of about 3 Inches diameter the place of their meeting is always upon some thing over the water, about July or aliquest; while they are in that state their young ones drop from them alive

in the Bodies of the mother flies. This fly is of a greyish Colour of is the first fly I have heard of thatis Trip arous or that has its first state in the waters. In Danderidge has now a large bunch of them in his Entinet. The male of the glownorm is something of the bettering but not so larged has cased wings which makes me Imagine that such of the ants as have wings are haves Is perhaps leave the finales after they have made them many as the make Sees or Drones are said to do. In Surman I some other parts of the west Indies, there is a line fly which they last the lanthorn fly that is faid to quelo a Considerable light. Panis or lack in the Lanthorn I suppose to be no more than a group of small Enlightened Insects. for it it County Fatures of Efflura from the Eurth or waters which are laften I by some cause or other had taken fire why does not the whole surface appear all in a flame atom time the Jadden Grotion agreet no mirally with that of Gnats. Besides was it vapours it could not popilly be of so long a duration. besides happening to obscome on this with m' fortrey the Chimist he told me he had often observed this Enlighten'd Tody abroad & had laught Some of the Insects which helped to Compose it.

is an Insect about the figues & shape of a louse Death there other a very small Insect made like a Beetle his watch. Commonly are found in July in dusty places, where they are Bred & feed . they tick only when they are about to generate see more of this creature in This Trans: 10 292 whitefied Jaste, Lees of wino, & on the outsides of wine ashis we find great van elies of hiring Greatures. & mopes where wine is kept afford with a microscope very Entertain hing prospects. Finegar & Sepper water likewise afford us a great variety. about sine take a Sint of clear Supper water & put to it for six whole pepper Cornes, Expense water them to the open air about 3 weeks. Is we may farther make it remark that if we put hair, leather, or any other part of animal bodies in water, & let it stand for greeks or a month in June, July, or august, we shall find it fill with Insects of different forms. Art is only the knowledge of hature in respect of fardering To Indge rightly of the method of treating plants, we must must first consider the soil Wateral toit hape time of the spring in the Country where it grows. In Temperate Tones we may observe that the greatest share of head only serves to ripen our fruits; but his the gentle warmth gravial Encreasing which makes our plants begetates. when the summer heat is four hature begins to make a 2º shoot which I believe we might bring to bear fair by a heat regulated by a Thermometer. his Common

Enough for Cherry trees strawberry & rasbernies to bring 64 fruit haturally in the autumn if the Blopoms of the first spring have been taken offat their first are generally Landy & Commonly abound with morales Lands on the I Sach To that I would advise the propagating of Firthers rovemental rery well with such land. See how to mannagothem? In. farren onds Heaths The halk hills agree very well with the Beech, English Phalk thesnut, but the walnut Especially rejoyees in that Toil if it has any Tolerable Thelter. The Beech is a lover of this soil to grows much quicker in it than in etter grownd & is raised from the mast without any dificulty see farther particulars 9:176. in wet grounds the orier, Alder, & arteel turn togin account see 9177. here follow observations on fish Sonds see 9 148 6 1812 The Chesnut tree will grow to an Entraordinary size for at Sartworth in Glowcesterhire at the seat of the Dince chartinayhere is now growing an English Chesnut the Girt of white is & foot about & foot above ground, his Tree divides itself at Grown who 3 limbs one of which measures 28 foot to half in girt of fort above the rown of the Tree, the soil is a Aft Clay Somewhat Loomy & the situation on

The horth west free of a hill this Tree was mentioned in a book dedicated to King John to was then thiled the great or To the snut tree at Tartworth, so that in all probability it must now be above 1000 years old. 9:176. I have learnt it is popible to have a grafted wange The Irange Tree or Plant in Bor & months from the seed or kernel Tree I have observed also that the seed of a Lemon with a new Broduce a plant much more rigorous than that of way of an Orange in the same time & therefore Lemon stocks Graffing are better than Iranges. not more than 4 months from it & other the Kernil her art the Fender stems Horizontally about Frees. half an Inch above the Ear leaves & shit it down about half an Inch then he took Gions of good bearing hers which were then Gender in shoot & Conformable to the strength & age of the stock & pruning the lower End wedge wise fixed it in the fefure & Fied it with Worsted, which takes allo room, & is subservient to the weather; over this binding he put a small quantity of grafting wax & in a few clays the stock & Gon are Togned & become as much one body as other grafts Is Cions will in 2 months ha doubtnot Every other him of fruit may be as Easily propogated. 9:189: He recomends the raising all kinds of flowers from preserve the young wood for the sake of large & good Grnes fruit it is therefore supropper to fuil a high wall for ornes, because all old wood would be taken

away & the most bigorous of the young shoots af 66 at due lengths for a crop: in this case wo must have regard to the substance of the wood we prese a Branch whose diameter is about half an Inch may be left a gard long; a branch of about me 3 of an inch in thickorep, about 2 foot. I so in be left to supply branches for the following year. In may when the Gardeners are ofliged to diment the times of the Growing branches, which begin to bud out we may plant Every shoot they put off with the same succeps as in november or December, but we must cover the part to be Interes with Common loft soap & we may be sure of a Arong plant before the Colder reasons reach us hence we learn that soap is of Excellent wer to the growth of fines, & that we gain a year by this discovery,

101

Wind

an Equipoise of the atmosphere producth a calm; but if that Equipoise be shore or less taken of a stream of air or Phus is there by produced either stronger things which cause alterations in the Equipois Emptions of vapours, rarefactions & Condensations, the fall of rain, prefuire of the Clouds. the most mineral & constant alterations of the Ballance of the Atmosphere, are from het & Cod, this is manifest in the general trade wines. Deskit It is found by Eseperience, that the Delocity of wind in a great storm is not more than & o or o miles an hour; & that a Common brisk wind moves 15 miles an hour; & some are so slow as not to move one mile an hour.

Wire drowing mut of gold.

a gold Ther drawer takes an ingot of selver of a Cylindrical figure two foot eight Inches long, & two Inches nino Lines in arcumference upon which he spreads as many leaves of Beaten Gold as weigh in all half an ounce. They then force the Extremity of the Cylinder through a round hale made in a plate of state the Entrance informich is wider than the other Extreme which they Call the Eye. When the Extremely of the Ingot is forced throught the Eye of the hole, they any hold of it with strong Fincer fastened to a thick Rope which is dal'd in by an Engine himed by rever men. They then make the telver to pass through several other holy successively finer & finer, tell

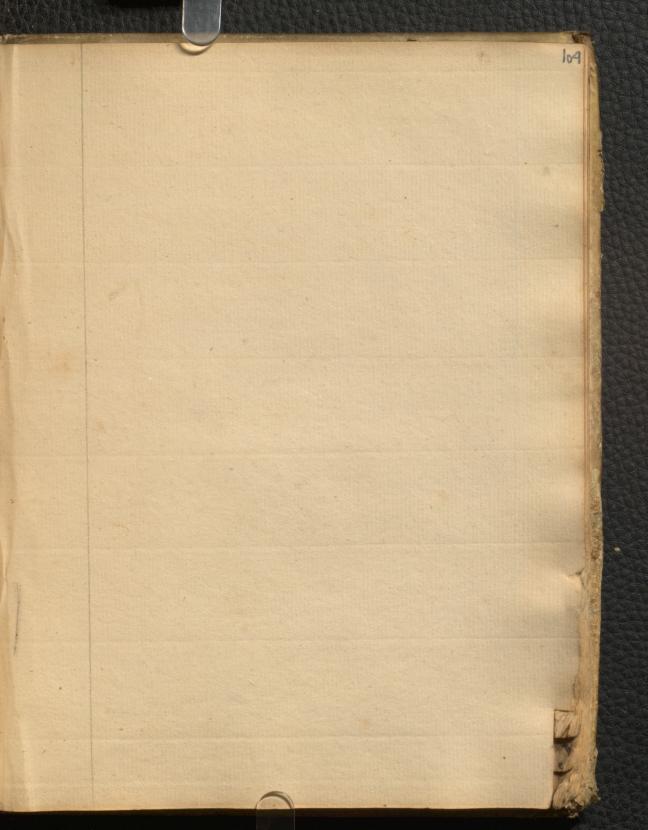
by degrees they draw it out to the small nep of a Wand, a tag, a Coarse thread, & East of all to that of a fine hair, subling it over with way Every time they work it through a fresh wire-drawing Iron, In order to render it more ductile, it paper through avove a hundared & forty holes before it is Brought to its atmost fineneps this attle Ingot is after all this Extended into a thread 307200 feet in length & for all this the Gold diffuses it self in such Equal proport as to make it appear one entire thread of gold. Windthe The Repels that produce wine are tall colipile being Composed of mette such as trap in the form of a hollow ball at ABCDE which is at first only fill with air & then being brught to to the Fire, the air is rarified so that a Considerable part of it get out at the aperture A which ough to be very small. This apperture is so made that this but it will receive water which will condensate the in to give papage to the water or force it to Enter to fill the bacuum after this set it on hot burning Oles on a simohon like that here represented, upon the as moach of the heat it will gradually rarely to by like

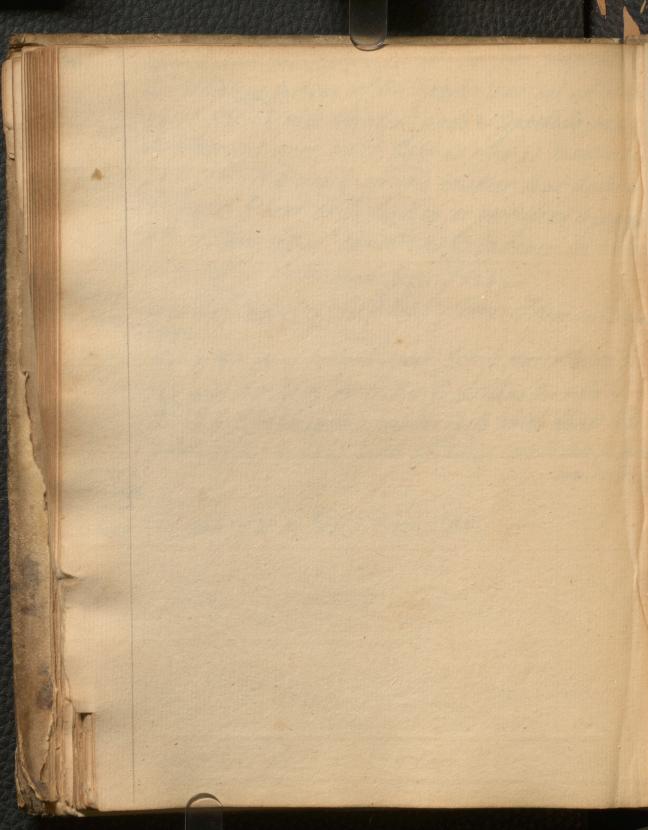
to little tise upon rapours which fly into the space 102 CBE where there was nothing but air, & hen he rapours is all thive to get out in a Groud at the apert ture A upon which occasion those which are next the aperture fly out with great relocity. If in stead of water you put spirits of wine instead of wind thereto will the a Continual Plane. This wind having all the Troperties of the other Minds some Thilosophers pretend to demonstrate from Thence the origin of winds by Companing the Cavities of mountains to this in the Oleopile, the water convayo from the sea to these Cuvities by subterrania papages, to the water here contained, or the heat in the forvels of the Earth to that under the chighle or Infine he sarrous chineks of the Earth through which the raporier spice to the hole of the stople watch springs how tempered see Colours orman: math: record Water The air bubbles naturally Compressed in water, because inling the the air acts with less force upon the surface of the kason of the Expand themselves & rise up to the surface Bubbles rising. therein. of the water. They air being wolently driven against the oblique wings Wind mill of the milt Endeavouring to dilute itself Every way by he motion thung explained virtue of its spring pushes the fails both toward the min

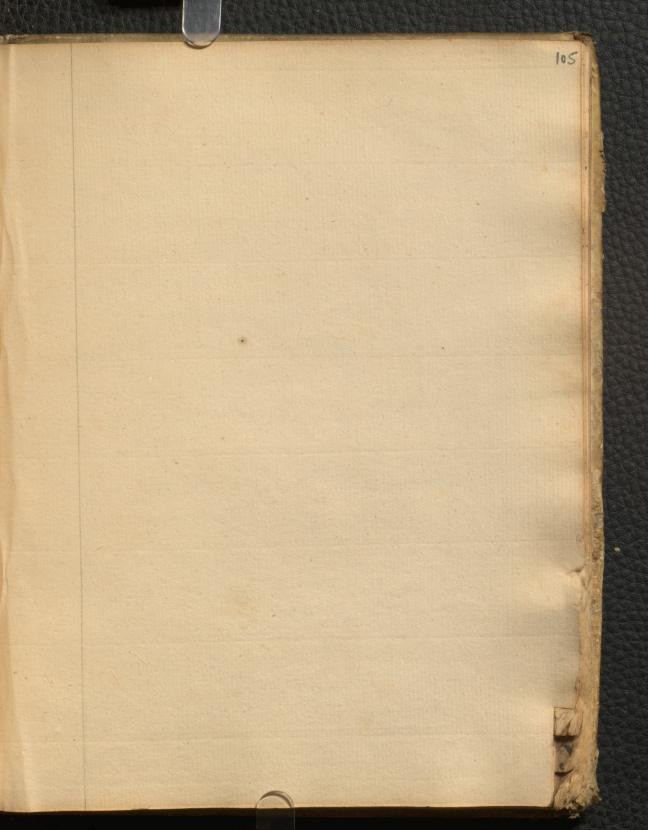
the rails cannot approach nearer to the mill without breaking they can without breaking follow the other Imprepion they followit or the mill goes round. The general causes of winds are the riolent Emphis Wind of rapour & Exhalations Caused by suffernmeous the Causes vapours & Exhalations. The rarefaction of the air of it. by subtervaneous fermentations or by the heat of The sun, or the fall of clouds. Jales Thy: 80 3 9.101 The air being rarefied, cannot posep a larger space without driving away the adjacent air; the air being driven flows to the place where it meets with least resistance & if this flowing be sensible it makes a Hind. Thus the air of the Chimney, being ranefiely the heat produces in the arr surrounding it a small wind, whose motion is accelerated & makes itself heard The Suterstices of the Boor or windows. The height largeness & situation of mountains 104 sometimes streightens the Papage of bapours & air agitated by that means lauses an accelleration in its motion. This Inotion becomes sensible to this is a real wind as on the Coasts of Genoa. P. 103 Does a svind Encounter high mountains & Clouds it is reflected making an angle of reflection almost Equal to be

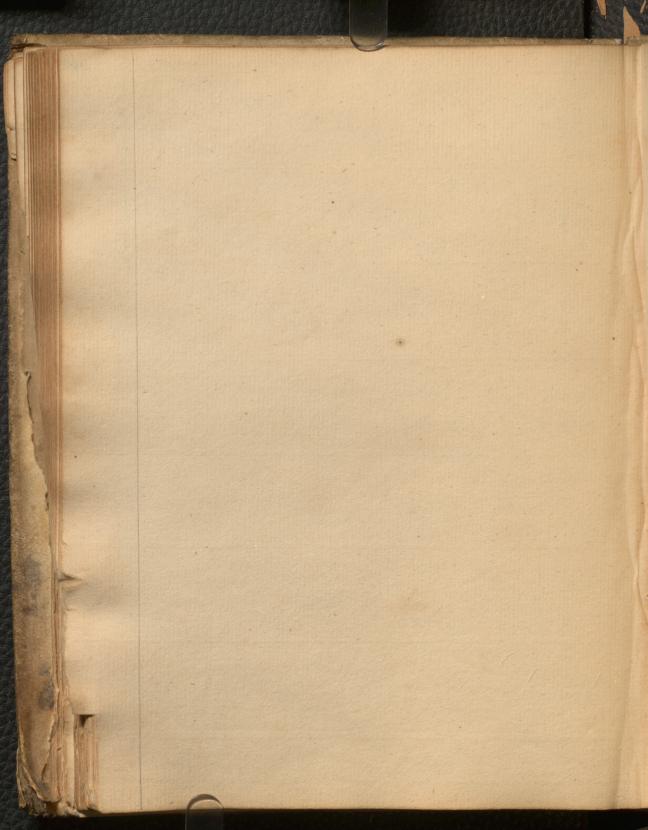
Fregular Fermentations produce variable mines. Thouse the action of sme subterraneous Fire, or some biolent Hurricans Fermentation, shoot out a great quantity of bapours & Exhalations oliquely into the dir, Thoule a Thick Class full obliquely from on high; the dir tharged with Exhalo & Tapoler & Impelli foreward with an Extraorinary Force spreads itself flows rapidly & rowhums what a Ever it meets with this is call a Minicano. The different qualities of winds. The greatest part of them proceed from diver Corpurcles which they carry of with them Mhence different according to the divers regions thro which they Tap. hence last ones proceed. winds which papover a great hack of land & but little tea, are generally dry. went winds as comeing over out length of rea are ordinarily rainy. Se Deles Pry tol3 9:108 why it refracts light less than Rir. see 9:12 at the Enorth, Water, mineral The cause of most of them see Jage yo 22. or salt water why it does not freeze so town as fresh is because that the particles of the two different boois when The sed trisced are put into motion by attraction which can es they to meet & Clash with great diolence. To that the water min with fall is more in motion has water alone & therefore why it are not so Entily conscaled as the particles of fresh, which I uppears do not point the toto noth such Grotent historis , 1920, bright & The following over of it Isaac hent may resolve diesnotes shing study says he all bodies, when feated befond a Cestain degree

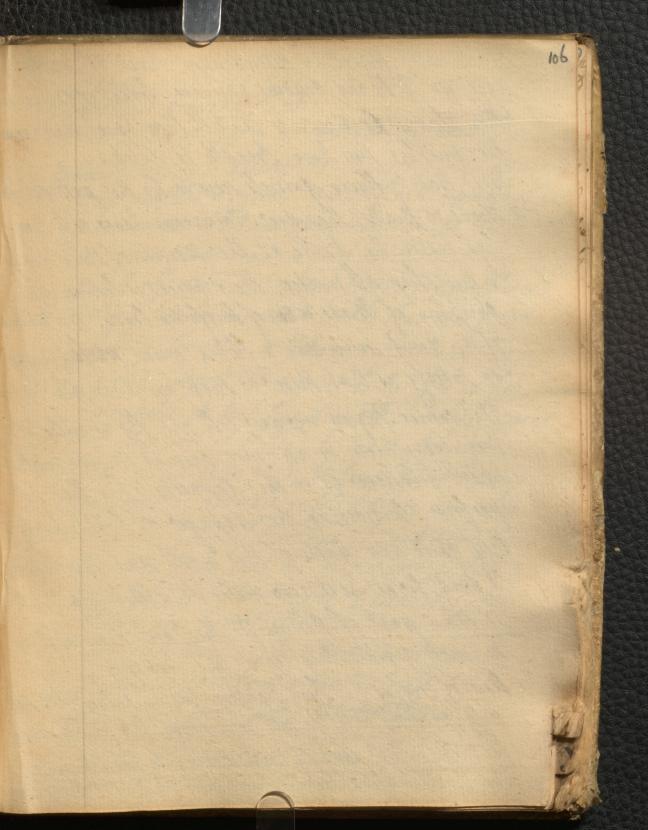
Emit light & shine? & is not this Emilsion performed by the Withating Instions of their parts & do not all Folices which abound with terrestial parts & Especially with Julphureous ones, Emit light as often as those askne parts are sufficiently agthated, whether that agitation be made by heat or by friction, or percupion, or putrefic hon or any other cause? as for Instance sea water in a taging storm. beren: Geogr. J. 224. Water ones the cause of their hear of some of them see hinera that of the sea is rendered sweet first by precipitating the talt with the Syl of Farter, then by distilling the water is thirdly by filtration with a peculiar Earth which flunts ellho points of the rolatile spirits of the beneth them for hints of the boren: jeggs. 9 214 nicros conical pre ervations of 20. the cause of it in First Beasts 9.43











Touls have generally a discretionary power of laying Eggs for if by any accident any are broke or carried and they always fortime to lay tell they have made up The humber they have thength to latch natural so the Bat & flying quirrels seem to be the papage him Birds & Beasts. They are biriparous have only two less beside the kooks at the points of their wings It they sleep all winter, their voice is between the Cherping of Birds & one of four footed beasts. The museum of the Royal Tocicty has a flying squiril, pringer tenough to satisfy us that there is such an animal. The carrier Ridgeon wer are toto will fly 20 miles in 15 minutes which in 24 hours amount to 1920 miles which I believe is in the Capacity of a bird to perform busidering the sapage of birds, which if they go to any parts of this word when they leavens it shust be at least 2000 miles i. E. Either into Surtary or some part of africa for they are herer of served in Europe when they Leave this Country. Beast of Stey as the Fron Santher Cut & nature has not only provided with Talents very sharp, but provided cases for them in the paws of the creatures to keep them so. The Buck is one of the Creatures that Thed his homes Every

year & is not longer than 3 months renewing them & lagain, which is a kind of regetation Equal to the 107 & quickest growing Plant. 48 The system of Eggs in all creatures supported Partilion. Tis surprising to ofseroe the Changes which appents Some reptiles & Insect an Infinite number of parts which were fold up, open themselves at the End of a Certain time; tome become absolutely uneless dryups & fall off others are altered beyond our knowledges. nothing law for more admirable than the Friding of Frogs the Men Changes. A Frog is a fish in its beginning Changes they named Tadpole, it respires by the Gils at fish; some undergo time after its fail fine drops off to its feet appear would the fore part of its head or mask falls off, with its mod 9:124. Gills; in the mean while the Lungs which resemble thou in Terrestial animals, unfold & dilate themselves. 9108, From the Continual sprouting of Freed after being out we may Learn that the whole Free is fill with brincholes or little Embrios of Branches, which he Ridden are nevertheles Existing & if they were me manifest would produce an Equal humber of seed which Consequently they must already Contain in the how were we to fator fut how Elm of 20 foot in stone at Every & times twould sprout to be should find include ore spaces of flines that is to say 13 housand & Kundred &

if we only suppose that Each grain of a Free Contains a second Free, which again Encloses the same humber of reeds, or hat wer can never discover a grain which Contains more Trees or a Free which Contains fewer Feets than the Preceeding the Froigious Chain of humbers hence arising will strike Ferror into those who are not used to sush their meditations to any great length, but those who are wied to the Andy of Thysick & hinhematicks, know very well that they cannot go far without meeting some kind of Infinity, as if the author of hature had Ken careful that his principle Character thouse I we agree with the System of unfolding of Parts in Hants, which I think there is no reason to cloubty wer man as Easily admit the same in animals. this fisten is the most simple of all others for if we take Ecclesias: 18 v.1 tin the Etheral sence Deus Greavit Omnia simul, no heed not formet ouredon how organized Podies may form themselves, whereas their Fortuitous formation will be as elificult to Dimen he past would so range themselves as to become a watch.

Trogs are in some respects like animals, in some like Insects, like the former in the number of their legs & the method of losting only in there the male 18 female are Joyned for 3 days, their fleshy parts Grogs are like animals, but the many thanges they under is as remarkable as any of the Insect race. again's frogs steep & are taid up in winter & heir differents degrees of like within & without the waters, make them somewhat analyous to Gnat, which his their first stage of life in the waters, & the remain of their time in another Element. here follows a description of the furioum frog which brings forth its young alive out of the Fores of its back see have some little affinity to Animals such as the hatching their young at once perfectly formed, Every single make bosepes the generative parts of both sexes to make ute of their Equally when they Gupter: The situation of these parts is on the left side of the Head hat are only to be discovered when they are generaling Which is about the Enidote of may, they remaining Comulation about 12 Hours to are then hardy to be Seperated without wounding their Parts, about &

Lay their Eggs in know about so in humber nearly inches deeps; for this they low monly make thoice of of a moist, Thady place, their Eggs are hatched in about a hinth & the young mails then appear above oring. Their meeting to louple is well worth observing in clery Evenings, or after a shower of Frain hey crawl upon the grap in a Greular manner, making several rounds All they come near Enough to hit their design. Their flesh is of a spangey texture, & the Frices which. afford it hourishment are viscous, which I suppose may be one reason why their motions are so very stone that kind of Snices being too thick to a substance to Circulate quickly. Their food is render leaves to which they devour by means of a Footh like body growing in their upper Jan with which they scrape the leaves to bieces. 9128 see Plate 28 a figure of these teeth & the general parts. The motion of the Juice's of the smail is so slow that it Comes heaver to a state of stagnation, than the motion of frices in other animals. The beast of the Heart of a young snail is observed to be in about s recons that of the to ones in & to observe this Twas forced to treak the shells of the old ones, which they repaired by flinging out a large quantity of riscous matter thro the pores of that part of the Fody which had been Encased before.

Their motion is performed by repeated imoulations with 22 preper a Fiscout matter out of their Fores serving for his on what soever they brand. Fis ofservalle the Tellom have any motion Except when in rearch of food, or in generating, & then only when the ground is wet, & it has. opportunity of supplying its lost Frices by fresh Food. have remarked, when a small pakes over a dry dusty place it looses so much of its viscous Juice hat it can hardy recover it again. Plag. Come now to mention spider of which there are above 140 different kinds in England. about the place where the riders head should be set in Bees or whasps we observe two feelers or antenno, with Forth like Jans for the Inching & mascerating their food. upon the appende of the same we discover their Eyes, & generally in humber differently placed in different spiders. The long legs which is of this Tribo has it fody undervided, this kind has het two Eyes, It Constantly remains in the place it is hatches in funlip it be provoked or disturbed. Tis remarkable that all our spiders in Englad have but & legisthore in the west Indies have fin. As they are of different clips they have different modes of motion & of catching their Rey; one of the smaller sort Sumps from place to Place; anotherkind after running about a gard make a full stop, & then running another stops again. Where are so very quick & Continued in their motion

that they will run about 10 yards in 2 seconds. some make their webs of the Figures of a Funnel net the Strider himself lying out of sight. These are generally found in Houses of are more boracious than any ofthe other kinds. Another sort makes his web of the france of a Casting net & Flaces himself in the Center. The west Indiane spider is about & Inches over has 10 legs lovered with long brown hair &it is said that ithe hiel is strong Enough to latch the humming bird which it press upon The ant is one of those prects which are Enioup the winter, some of these are larger than our Common Rouse this & are talle Horse ants & are Lelson Fewer than for 6000 togather their habitation is commonly under the roots of great Frees. they feed formmonly on dead Insects or Carrion, the the Common small kind or agree with them in Every respect but their use If we oven their nests we discover Johenes in several ranges one above another. if they find any of their own Brood dilled they Immediately removed him from their habitation. Her is no better way to prepare the sheletons of mice or other small animals than by fixing them in a propper posture in a little fox with Holes in it & Burying it amongst auts, which in a few days will clear the bones of all the Hesh in June to July the lant bring out their Eggs when the sun begins to be not in the morning to take them in again when the sun begins to

decline & this they Continue to do till they are hearthed. 110 54. Jam at a lop, to know whether those which are winged a mong them, are the young or the to that it is lettin those which have wings have the rest in a few days we perhaps to seek some other habitation. I have offerved one sort of and which law it Eggs in the back of the bak leaf & raises the blister in the leaves, which we call the Cak beines which are rowns Is about the bigness of a half grown grape, in Every one of these is a single Insect perfectly formed to that it aspea it has no change after hatching Changes not it figure after it is once hatched; but only The Ear osio which it is full grown we may discover its wings This up in small lases upon the middle of it boy. Bullerfly kind have their wings awrned with feathers as regular placed as those in the wings of birdt. all butterflies have moth long Henver antenne knotted at the point, but the With's have theirs short & feathered. The first fly only When the sun is up, the other only when his set the the will live 3 weeks but the moth Inever observe to live so long. In Compling the Female always Enters the Fody of the male which is only the same with the long Ply. Their transparent Eggs are sterile, but the others will hatch at proper reasons. Their formin their hy mysha State are agreeable to their several tribes to have some of them in that state the appearance of 8 % 10 less got altho they never Excess of humber when they some to hardring

50 + all these chining the time they are in the humpha food as upon the Leaves or flowers of plants. hature has also appointed Each Insect to feed only upon a particular blank to the Flowers have Equally different kinds of destroyers as the leaves have; it I think such as feed upon the Hopoms or flowers of regetables change Commonly into broth's & the feat Eaters into Butterflies. Tome of these when they change from the Caterpiller state mto a Chrysilis, Enclose themselves in setken bags. others make their retreat under shelter, & others make their way into the Earth while they are in this take some of the moth & Butterfly kind are so large asto measure 9 4 10 Inches between the Estream points of their wings, Especially among those which breed about amboina in the East Indies & might Certainly be propogated here had we the proper haves to feed them with & perhaps might produce Something as wefu as silk, if we were to Enquire who them. + Bees Tee the History of the Royal accad! of Jaris for the year 1712. The matter of which the fees make their Wax is chiefly the farine facundans, or dust of the apices of flowers, which They gather in small parcels, & lodge in the curities of the hind less of Even upon the hain of their bodies for which was

all Bodies as yet made right of being subject to dilate 28 & Contract by heat & lots in some degree may hig not That be reasonably supposed by means of their Fores to review animeral a kind of hourishing fine from the next neighbouring have 2 n Fin Again to by that help in a long series of years swell of howth & become largers & if this were about we might her suppose mineral bodies had a kind of frowth . 9.3. Take 3 pounds of sand in 3 parcels well dried make Each into a parte the it with water, ye'r with soup is water, is yo To with out & Lay them in the sun. the swill fall tonicas 402 will be more retention yet 30 will be quite hard. hence I suppose Jano, Loams Clay to be Composes o Sandy particles but mixed with Liquors analogous to day Phose fust mentioned - sainty Soils mourished with unter probables parts. Loam misced with some viscous Liquid & Membre more finding. Clay misced with Pile parts of this face Sandy particlesthe more Inclines to believe, because water Easily pent the Loan, & the discous parts of it may be washed and without dificulty, but day resists the water which seems Somewhat Chayenous. I 4 the aw more rivered and answersen By numbers of Experiments it has been found that the strata of Lead Lin Copperse do not the regular

in One Country at in another, Even the? hardest of them, at this day were once no more than thin mud little denser than water; to that Bodies of no more weight than Thells, or reeth of fishes, would subside themselves down to the follow or lodge themselves in it: we have Instances Enough to prove this from many kinds of shells, Fish bones, bits of plants & Animals found Even in booies as hard as marble & almost Every quarry of Stone which shells to tould never have been there, if the marble & other stones they are found in had always been of the same hardness. The Examine the account fent to the Roy Joci of alive. Food out out of the middle of a block of hard stone , we may reasonably Imagine that the tout nothe above 100 years from it fluid state to the time it was taken out of the Quarry without we suppose a Toad Can live above 100 years. We have an instance of the Consolicating of sand Lime & water & whether there may be found som Kind of Liquid to him with Jana & Lime which will make them more finding & Expedite their harding heave by the architects to be Considered. P.g the Hone testainly grow in quarries gradually not by any funcion begetation, the there is something like it in totals. But

o energy by apposition of parts to parts, as is notonials 30 in the Hours of Statheraneous grots & Caverns. 910. Scant but magine metalick bodies andergo various metalick alterations & have different degrees of rip enep, some Podies What analogus to those in Intectile Bodies. Fiz dowe take 20 Tilver mines an Equal quantity of one no for their Shall hardly find 2 sorts produce the rame proportion of silver which happens I suppose because one is in a riper state than another, perhaps that which is now Tilver, was Lead, or some other metal 1000 wast you as for Sebles, flint: & D' Toodward supported themal originally to have been formed in the Earth & Even the amber which he makes a hataral fofiles the reasons her gives for our Finding Tomany of them of their Sorte is that by diotent Rains or the sea the Earthy Eperation & colours parts are disolved & Carried away but there being not disolable & more ponocrous are left behing diverseign their Terrestrial Covering. The hourishment & difference of lolours given there booies, I suppose to be produced a hearly the same cause as that which gives the difference of Colours in leaves is flanters of vegetables. The Several Strainers & besels which Compose plants doing perhaps the same office that the several in Trices paping through the several bear of Earth are

aftered by a sort of Filtration & varied by mixing with some mineral Corpuscles, which would be went without such afristance; to these Inices differently Strained through the several kines of Earth, mixing with some begetable particles, which change their qualities, produce difference of Colours in the leaves & flowers of the Plants they pass through . 9.13. hence it seems to be very plain that minerals have a kind of Growth & life that in a les deure than Hants, as it is slower, It will not admit of being many The passage between these & plants seems to to Coral ship is alowed a place amongst begetables. The it has a proporty of duration beyond any other of the regetative yet is its Reanner of fiscing itself to Rocks & stones who to has of plants to its franches there to bear some resemblance. prover we find it of different species, as much as any and plant. The britheres of it will not be any reason For not placing it amongst begetables for succulent Hants as those of the Fig aloe are Equally britte because they want Longitusinal repels. The sponge is the next which had to begetation who the allower a plant yet is reemingly Imperfect it is

a handerer as well as the tens palustrid while 32 Shikes its roots into the water only the sponge is generally globular & Composed of parts more like the The Than any other part of a Plant, this without Either Leaves, flower or Fruit as far a see can discour the heset to this cens to be the Brufles next to That the Jungus. 9:18. hushroom, The method of raising them from ching see Ingthe best to he Rush seems to follow the Fungus which is a sort of an amphibious plant. Then the melon & Forch Thistes. These the Invian for which neaver demproaches to the resemblance of Leaves. here follows an Epay on the analogs between Hants & Animals, drown from the difference of their Texes. Tev 9. 2. 8th /2.93. The neset to the Thiskes are the Kerb kind as are the Grasses, the Trimrose auricula Sink, Talip. the Han berry & tiolet and are the next to there ofthe dwarf kind The 30 sort is of those Flants theath are assiring which as they have not strength of for to support themselves nature has given them a sort of Instinct to avoance towards any thing to support it . the 4th is the Gourd or the Gea kind. which as they want the Jower of Twisting rature has Inported them with Claspers

a Shrow is that Genus of Hants which in Every 33 Or cumstance Except its figues & Muration Smitates a Tree of this race is the goos berry, myrke, & Caper The Caper. a new way of bringing the last to perfection tev 936. The 2 race of should are such as have an Inclination to Climbers the Konysuckles Sefamines &cyears is such as have Caspers as the rine to 4th is such as have Ferinils for Climbing which his Shike into the bark of Frees which fam Encines to believe they draw same support from as the Frees they grow about scarce Ever make so bigorous thooks as those that are Clear of them. of this kind is the roy & virginia Creeper se The Free is a plant, he must lofty in Growth whas its parts the most robust, amongst which we may follow the distin Tomiferous 24 Fransferous 3 by Antiferous 4thy Consperous graf Glandiferous. Ive may remark that a Free is a body on which is dependant many Regitable Bodies the first of which are such as cannot descend without it, as the staming with their aprices found in the stofoms, there are for the most part like formany funge faking root in the foot ralk of the Hower, or Este in the bottom of the calya. their office is to impregnate the styles of the Blosoms with the rangina

they produce But soon as they have done they drop of The Petals or Hower leaves are also Stanfulas almost of & the same kind, & their office is to guard the Fender Organs of Generation from low to other Repries, there also having performed their work drop from their mother Stant the tongest of their tife as well as the Stamen) is 2 Snorths. The next we come to Consider is the visum or mishetoe, which is a super plant that can never be made familiar misletoe Enough with the Earth to take root therein it can only bes propagated by the seeds sticking to the barks of Theis into which it strikes took first it sond out from its Center 3 Claws , which fise on the bark in a Friangle , are at their Extremities like the month's of Leeches, there fasten & fegur to seperate at the Center of the seed as of Each Claw was to become a distant Slant, but in a year or two these Claws are Enlarged Enough to meet at their root Soint, & are so strongly united that they make the foundation of fat one Hant to the place of their first royning in the Center of the Leed opens, & divid so that there appears 3 distinct branches spreading from the Root; after this it proceeds to blotom, & bear fruit & will live to agreat ago. his remarkable that there is but one sort of this in England, the that of the Oak has been the most admired get I can't find but that of the apple to not offerved that This Letween plants growing on day grant and

or that because Isuppose they think a Plant still presen 35 its Priginal Firthe let it grow in any soil, but this will admit of disputes for the we find & graft of Golden Sippia may be grafted on as many forth of heer to get the Properties of the Golden Sippin remain the same, get an Cak planted upon a dry hill will not shoot a 3 pan Townsen as one in a day bottom to flowers Continual Change their Colour with the Foil. This plant is a specifick in Epelephick Cases. 9.39th we are next to Consider mosel growing upon the barks of Frees as the lup mot that which branches like bred & that like a Funch of wool, these are all white, bear sews, but are notes perfect as the green mopes. The time for their growing is in Cetober. He now Come to those begetables that depend upon Frees but such as may nevertheles be made to familiar with the Frices of the Easth, that from the single part of " a Free they became perfect Slants. for Instance plant the Leaves of brange frees & ther Evergreens & they will take Root & produce perfect plants if well watered & kept in the Thad o. the leaves of aloes will do the rame. Twigs & Granches are really tomany plants growing upon oneanother Superable the twigs take root in the branches, they in the Stem.

The Growth of Frees scarcely Gredible, the proportion between 36 an acorn to a full grown Oak Computer to how much one acorn must unfold the sure stamp of an all powerful Oventor. 100 945. The proportion also between the Gourd & its seed, Emputed 8:46. the Leaves of the same plant when full grown measure about 10 Inches Over these from their state in the fue. fill they are fully Explained, require about relast which is about an men & half Each day to that we may very probably offero heir motion with the microscope & offerve the arculation of the sup in the Cat & have the Satis faction of Steing the plant grow, is its parts more much quicker than the hand of a Clock & without panded or tests in its motion. Tome unskilful people have thought that some thanks have there of rensation as the humble & tensitive Plants the Will or spurting Encumber, the seed pros Hank of the female Balsoms, but this is far from reison Considered. When we consider that the fruit of the will accume never flies from its Irine, till its befiels are over replete with Juices, which is the same case with the Leed pools of the Balsoms, whose parts are to full when they are quite ripe, that the god burst open at the least touch, but the falling down of The leaves of the fumble Plant to the loving of those of the sensitive, seems Either to proceed from

the tenderness of the bessels which lowey their says into them & fasten them to the Twigs they grow upon or Else that they Cannot bear and Cold of uncommon Instion of the air. for in a very warm day, theren the air is serene, these Plants, if they stare atroad are not affected by it, or will scarcely give way the they we toucher with some violence; but it the weather to look they are seemingly declining & resist the fouch without any Alteration. On the Contrary when kept Continually ander glasses, or the sun thines upon them, they do not only decline if touched with the hand, but are subject to the same alteration by any Extraordinary prepare or motion of the dir by a fan or handkerchief at some dishin from them: & I observe they never appear in a right state of health, or have their leaves sapanded, from the time of the sun's setting till his risen again. 9:47th I come in the next place to treat of those bodies which, like plants want Local motion, but have such a share of Animal life as to afford them the Fower of tensation of these are the Buster, he muscle, he cookle the Barnielo &c which are not as I can learn able to remove themselves from their first station, & the we find them tometimes in places not before of the how or from

the mann of them which this upon the water & is 34 Carried from place to place by the winds or Tides. "6 Tis temarked for some curious ofserver that such Sull fish are androgenous, which is the same with Plants which are Each of them Confined to their reveral Stations without the Fower of seeking at distance one of a Contrary Sesco. The Outer has its station to deep as scarce Ever to be uncovered. The musclo its in such places as become Exposed to the open air get the fall of the Fides. The Cockle is always Geoded in the fand upon those shores that are Covered at low Fives & are seemingly feel like Eath worms. Pasters & muscles will feel upon sea weed when they can get at it as instance the ourters at Colchester on the baskets on Crowfilk. In the East Indies there are dysters me of whose shells will weigh 100 weight one of which is to be seen in The Ginosities of In Pocock at Greenwhich here reas to have only the sences of felling & tasting. These Just Enjoy a degree of life Ferind that of heartables which have no sente that we an find out. Their thels have tikenise a reschative abouth, & have also vehels of Communication with the animal they but To that It seems as it the thices of one was necessary for half

of the other. The sorting & Septemento are the Vneset taken notice of the last of which have a persendicular motion in the mater raising themselves perpendicularly to the surface, by flaping their theis with a frest mick motion & his very probable the Jeohop has the same which seems only to be a larger Kind of them here follow me Lewenkook's observations on muscles y. B. The next fish to these are the Lotsters Erab Starfin the which have tocal motion. The lobsten state we may suppose partly regetable, partly animal as cland if broke of will grow again, for tychills have a power of rehewing their branches when they are Hoken or tut off. Fut no animal Iknow of his the power of renewing a lost limb. here follows a description of the Lotter & Crab 9: 34. is another genus of moveable shellfish, the its motion is performed by bending its printed rays backmands & forewards the mouths of this kind are in the Enterof their fodies. & For not find any tripico for the discharge of Excrement, no more than for the service of generation.

of an unduliting motion of their fleshy parts out 40. If the shell some of these can mim & creep at their pleasure others only every upon the runs or rocks. The perininkles or water mails have the same more of bustion as these the hantilus, Purpura strombus mures, Buccinus Frochus, Concha &c I come now to treat of fuch fish as are merely this Inhabitants of the waters that can freath no other Element such as have their motion on Swimming tale with find at Part, the water we stainly eliscover only answers the same and to them as and to us for they all feed upon plants, Kerts, Insects or other fish & his for this reason they was from place to place a lertain seasons in tearch of their food. I am Informed that Even whales as in books from the most morthern parts as fares the bast of human where the sen is full of week this fish is Giriperous & suchlis her young whigh herer Exceed two in humber. macharel Herring & many other kinds of fish have their reasons of Coming upon our Coasts his ofserved that the for of pathaged some in shouls, as punchally as the temper of the reas on will bemit on which it a he sonder that their palage so much depends the sea or river weed must have a certain remponde

of air to bring them fore ward, the insects of the water depend also on the same cause to if our papaged fish are fish of prey, the fish they preyapon will not oun before them, if they cannot meet with hecepany food. most fish shift their places at spanning time asnil for the preservation of their young as for the sake of their food by observing we may Easily see how admirably hature adapts her gifts to Each Kind both for its preservation & sastinance. The Elying Fish has fins of so great a lingth, as to do the office of wings for some time, to avoid the Dolph some are provided with swords some sand some Tikes & their shells here follows an account Ma Ticklebacks hest 9.62. Fish seem to Enjoy the Lower of Sensation as well as other Animals. Their sight cannot be disputed, is as too find most kinds of fish will take one bait rather than Another, altho they are composed of several Ingredients, to have no regular form we may reasonas Suppose that their fast or smelling is more pleasantly affected by one thing than another, as for their hearing Those lary which tome to feed at the found of a white

42 or at any other call they are used to prove that beyon Contradiction. here follow two or 3 relations to Confirm"89 this in Fike Carp, Tench 9:63. Every fish is supplyed with faws framed for the taking to macerating its peculiar sort of food, such as feed upon weeks & Insect have Felom any reek Juch as pregupon fish have one two or 3 rows The gills of the Cod are quarous with both the bones which I suppose are no less Contributing to maceration than reelle themselves. The fins are in proportion to the fooies they relate to, & serve at Part their Tailas a Ruder & for the more lasy Fending of their Godies their back bone consists of bery short bertebro so royned that their Fail may Enjoy be fent up to their head & their scales are to regularly Maced in hows one over another & Covered with such a biscous maker that they give way without dificulty to the motion of the fishes body. The Thave of life which Tome fish gosefis very remain as in the Eel being aut to pieces, maintains tipe & Instion for several hours, as if Every muscle info a distinct Soul or spring of motion whereby it tives till the part wanting a supply of Roundhmin is forced to submit which is something like the poor he offeroo in plants Every distinct part of Plants. next to this is the carp which his Common to transport

40 miles alive in wheat straw. The Eeles heart will 45 beat regularly an hour after seperation. not only salt water is necessary for the keeping of Jen fish but that also should be kept in Broken for which geason the fish women in Holland keep their water in which they fish are kept perpetual in hish with a paddle which if they mit for but a few minutes the fish die. Tis plain that the Eir culation of Juices in different creatures is not always promoted by the same laune or performed in the same manner for no Creature can live any longer than their Tuices circulate In Every one alons in land animals the heart ithe Immediate Cause of arculation where as the Elles Ears will live several Hours with out it. 268, Feen to poles many particulars found in Fish, the manner of placing their scales, their Ed like motion & above all new digree of life after cut to preces. of these For not Find above 3 sorts in England of make the siper 8 pe Stoutworm. The it is a Harmles creature the many believe to the Contrary, we riper has Indeed a deadly poison longed in fittle fanders about the Roots of his fangs; but his whole tody fesides is Esteemed a dainty to Eastern very frequently.

Sumediately after his race follow the Crocadile attended 44 Lizard se we have accounts of Crownedles & Allegators "9 of about to foot in tength, & am of aprinion that some of these creatures having been formerly in England has given gite to those fabulous accounts handed down to our times of Tragons, & this The more readily believe because the reletons of such creatures, or the hop--chions of them in Aone, or other mineral matter have been duy in Several parts of this Kingdom, which Theres plainly there have been such creatures in This Island. The Livzard kind is very numerous. water neutes are of the Kando figure, & are faid to fer Foisonous; the I have handled them very often without recieving my hents Injury from them. they lass Eggs to about 8 or 10 this neither feed nor sickle their young from the time they are hatched. Crocaciles are said to do the same. Tometion The Camelion is something of the same figure to it tives Entirely on Land, its skin is shapreend it that of the dog fish & transparent to that some times one may percieve different about throughing as its for happens to be in a different state. thereon Consists of flies, which they catch by darling out their Form with great quickness. all these animals are this tip affects in the sounter. The creature which seems peat ally to the foregon Zizard a race is the flying tozard which is southing of the lot llinus one.

of the Brown Lizard found on humpsted Common with a fag ander its Throat full of Poison in the west mois there is a kind of them of a different Colour from the former with a skin the a myother leaf hanging underits throat toth are Priparous, have he power of fught & generally werch upon Frees. The First which have such kind of rest is are lost. to the during the winter are swallows, markins, smith, luckows, Ritingales. & Some others the Temperature of the spring air put the Inices of all the sleeper whether animals or regetables into motion & if at any time out a temperature happens before april as it did in 1719 In January o Sebulary has the James Effect. She feathers of Birds vary in make & Colour, with Colours respect to the different parts of the Body they from Blods & upon; & this bariety seems to proceed from the difference Lasts not the Juices in the different parts they lover? all your eason of First are Clothed in different Colours from More they are white dreped in when full grown, to that I suppose the frices in the first stage of life have not the same power in any part as they have when full grown. The hair & wool of Enadripeds Change? Colour as they grow older; for the same reason feathers I suppose have a kind of segetable life

It Hank it not unlikely they come from seeks 46. are all of them renewed yearly is therefore it is he him I want of hourishment or over abundant heat of the First body, after their colours; which is no more than the leaves & flowers changed as the hature of the soil direct. I believe Every kind of Fird may have one of it race with white Teathers which hapens from the want of hourishment, or some ill quality residing in the Intes that feed them aftered have some how in the west Findies that fasten thornest to the End Kirds nest of tender Swigs & hang upon strings of about hund to he half a yard in tength & by this means preserve Ends of Twigs themselves & young from destroying bermin I so The speaking an account of it to J.81. The wings of Birds answer to the fore feet of Beasts Is a pist them to ingo on swifter as well as to fly. their legs are all of them Grend with scales their have generally 3 Fres & a Reel, their Pails Chiefly ha Them to rise from the growned & serve as Ruddenso graide their fodies in the dir. Raven's as if smelling was the most perfect of their areas will follow carrion many miles. Some are very bigians in latching Insects from whence we may reasonably Conjecture that the cause of Birds paking from one Country to another is to meet with propper food here for

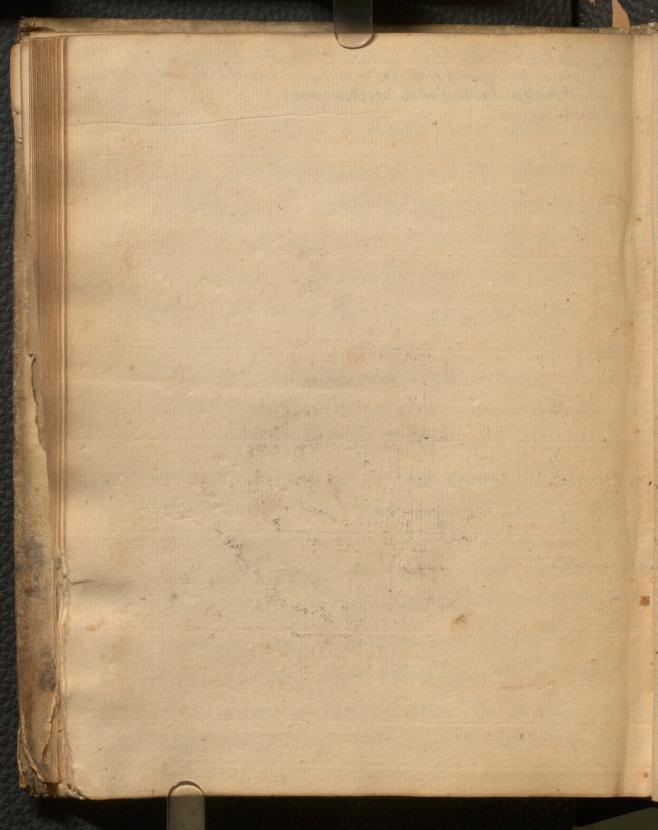
as soon as Ever the fire breaks loose from the Builbles air & kindles the other Combustable matter it meets with the air being thereby Expanded & put into a violent agithis the Increase rushes Impetuously against the neighbourne Cours, of the Rain which being biolently Impressed by the force of the min the Bubbles of which they are Composed, break & discharge their fire akewise in all directions; which heaparty Coauses a succession of flashes, & makes the Rain power down with greater behemence than before, & this is generaly the fase Immediately after a Thunder Clap. Though winds very often proceed from under the Earth, where they are formed by a stream of air rarified by the subternaneous fires, & violently Impelled upwards, get there are also winds that Inne out of the Clouds & make femille havcek in a very little compan, butin whire winds peops endicularly upon some places & whirling round in Eddies without doing any damage in places that are Contiguous. & these are occasioned by the Enghi of the air from the Bubbles of water in the atmosphere which acts with the greatest Elastick force, where It meets with the least resistance from the Clouds home Come those mischievous Effects which are produced by him. in times of Thunder & stormer. The first wind that inves before it the Body of the Cloud generally Blows in an Minison

The air of any Impurities or unwholesome bapour that too long a stugnation might Occasion, by elisting Hose swarms of Insects, which though useful in some respects, yet would prove prejudicial to man if suffered to multiply in too grate abundance. The bapours being Condensed & falling clown invain Earth Quakes on the surface of the Earth, mix with the satter how Can= which the air has there deposited, the different sults sed. with which the Bodies of animals abound, oil, dung swepings & many different Compositions which som with the water into the Earth through tenthousand different drains & figures, sometimes stearing their course over strata of salt, sometimes over beis of sulph at one time paping through mines of Iron, at an other through tayes of Eithol, dipolving & carrying away part of these Bodies as they pass along. There sufferrancous Rivers Cast up on the sides of their Channels greater or smaller quantities of thesestiflina materials, which dry & Incrustate in layers one upon -another as the water apens & falls away the ampoint being thus formed, the least Sarricle of Tire (Groughthin by the wind, or kindled by any other means, whether by fermentation, which is very Common betweet sulphirous &

Inineral Bodies, or by some map of Burning sulphi in the subterraneous Caverns) inflames these Particles of oils, which are fontiguous to it & those Communic -ate it from one Frain of sulphur to another. The Combustion being thus Begun, the mineral particles distolve, the air conveyed underground in its behicles of water is dilated, & violently repells he ralt Peters which is the most powerful of all the Combustable Engredients. Thus the rarifaction of the air, & the Projection of the salt with which it is Impregnated, Conspire to act with such amazing behemences fury, volcands that where ever they meet with any resistance to obstruct their papage, they make the very Earth to shake & tremble from the Genter to the surfacezover Throw whole Towns & would lay in ruine whose kingson had not Frovidence, which weight both the asefalus & dangerouse Effects of these tremendous forces, set soin to their power, by opening at propper distances Cermo rolcanos, or vent holes, that being chis perced in the greek volcands are a pleping to the Countries they are in. Dayly Observation of what passes in aim of Every General Country a little before tunnise, will helver to a when at the Break of Day there happens to be my

settled wind, we generally perceive, at the time of the sun, approach to our Konzon & a little of after it is Risen, a presty Brisk Easternly gale, which probably proceeds from the castern air being Dilated by the return of the sun, & driving before it that which is more Dense & faither from the Jun, which necessarily causes an Easternly wind which ceases as the sun advances to our mendian wind must always precede the sun in the Torid Zone, or blow stronger there than in our Climates where the Influence of the sun is more moderate. The Frade But in as much as the sun papes by Degrees from wind's. one Tropick to the other when it advances towards the horth, the northern air be acted upon to the heat Endeavours to Expand it self, But being oppose. by the Body of Convensed air which is still more northern, it must consequently be reflected tack to the aquator, from which quarter it finds the least resistance. hence proceed the trade or annual winds, which bring with them those bast quantities of Ruin that proved to serviceable & refreshing to the

Inhertrants of the Forid Zone on this Tide the Digitals the Discourse on the Properties of the air in the 3 vot: hature Displayed voly 8 9222 of nature Displayed beginning at the 201 Juge is very well worth reading.



out of D' Fower on the animal spirits Jugo ye 61" Tis harmal to believe that animal spirits are diffused throughout the Iniverse in all Fories what soever, to give formentation or moretion to minerals, Degetation to maturation to Plant, & motion to animals. & least they though the the their execution because of their executing totablish hature hath Emprisoned them in several froises so that they - they may be considered as in 3 states & fixon. 1. Fiscation is when they are so Constituted & locked in within the particles of matter that they last hardly ber seperated as in Gold wother minerals. 34 Jusion is when the pirit fa kind of help have so arought themsely Howards " liberty, that they are in the middle way howards bolatility, as in half Concocked minerals, formenting bapours & Liquers to half ripened fruits. 3 by the Spirit are in their states of Volutility when after a strugle with the Groter particles they have overcome them trave ready to fly away as wine in the height of fermentation, to in some part of our arterial blood always. Two offerve, Mat those Lodies that relase to open the groper Compositions of Broies, do presently oreate a fermentation; for being like somany kears they Let the swirts at Liberty, which presently fall to work & by alternating the frozer parts, seperating the Reterrogenous, rolatizing some precio - Wating others, dioesting some & Expelling one do atlast work it tohe A body as the part of it are fit to Conspose? in all which there is a Tensible heat produced: Thus this spirit being Emboweld in the Each to meeting there with Convenient matter doth produce historials Oceaning an Actual heat, wheretoever it operates, as in Alum & Comerate Mines, which being broken Exposed & Moistred will gather an actual hear, & province much more of those minerals, than the the miner would

The spirits that are todged in meats to drinks are in he internal laborary of man set at Liberty & transmitted to the Brain & there reposited for the Jeroice of the whole machine. To that what we eat the animal spirit are the purest, subtlest & most volatile particles of the Blood, which by the Continual pulsation of the heart are carried with the Blow into the Brain of there by that lase of boggs substance are soutifed of seperated from the Blows & thence by the Spinal marrow & nerves transmitted to all the Parts The Body. The Chile of Blond (Secause of their grother hourdity) heed to be Conveyed in hollow proes as reins & arteries but the spirit herwings of both can early pap by a mick Thration through Brain sprad norm to nerves membranes or fiber which are is it were the Eords stuff & tackling to the behel of the Body that spirit are the Immediate husband of the soul in all her operations forth of sences motion we have the greater reason to believe. First for Instance it is plain from what is discovered in a Girligo: for the Brain itself is not so much a fluid substance, asto fam round; therefore it is a sign that the Intradiate Corporcul Instrument of Conveying the smages of things, are the spirit in the Brain secondly that they are the dief Engine of sight is plain not only recours the Equis full of here hord pirit; but also because dinnel of light lomes from a deficiency of them, the the parts of the Eye to otherite entire Entire as in sick & or persons. A lefter quantity & staver motions of the spirit is required for sensation than for motion, in Instion the muscle swell that proce the partitude is a place Indication of a greater flux of spirits directed thinker. For motion have it seent the spirit more Superhously down the hervous filament which are holow but for sensation they only Creep by a filtration, down their Coats & membranes. how there spirit being so subtole the soul spends them Every day in wing

the sence therest wer all lapitude; for if it were an immediate faculty of the roul to Contribute motion to any matter, I do not underly how me tout Ever be weary. from there observations sleep seems to be a retraction of the swint into the Brain, or at least a stagnation of them in the newous past till resture being recourted by supply as regeneration of them in the kining direct frem into the spenal marrow & herves which being replinites with them again, they fun their current as Pefore?

Dales Physics, wel 1st Why is spirit of hitre a propper dipolocut of selver Is not of Gold, is spirit of rea salt a propper distribuent of Gold to not of Selver why does agua Regia reduce Gold into a Liquor, without disolving Silver, whilst agua fortis reduces silver into a Liquior without dissolving Gold? the different porosity of Gold & riber probably was those different Effects. Tince Got weight much shore han Tilver, probably the pores of Gold are much straight whence the points of the spirit of full being probably firer has those of the spirit of nitee, find themselves too muchat therty in the Fores of silver & make no impression uponit; but Thirty with difficulty into those of Goto, they produce therein the effect of a wedge, by dividing or disparing the Sale departs. on the Contrary the Sints of sperit of hitre being probably hicker than those of sea salt penetrate the pores of silver with difficulty or therein do the hisin of a heeger. but not being able to run into the pore of fold they make no impression upon it; however being missed with sea salt in the agua Regia they find accep Corrober Is demolish it because the spirit of salt makes them fine Enought to gain with some Effort a papage into the foto

it sometimes happens that Rance forthis too pures is a soft of a gra regia that dipipates gots & spares silver: bour upon it a certain quantity of Common Pater & it will dipipate silver & spares Gold. whence does this then proceed but from the Enequality of the Fores. 419: Vine a water discover to us as well as spirit of salt is hitre a difference in Pores: for wine which is filled & Insignated into the substance of several Bodies, does not allways pap through where water safes. I you suspect and histure of water in wine power the Lignor into a repel made of Joy & the water will distill through the Cup drop by drop to the pure wine remains 9:42 Run two Jins into the two Extremities of a stick about 3 foot long dry & as large as your arm. place two glapes half full of water upon the tables of Equal height about 3 foot distant put the stick in an Horizonto Situation to that the two Pins may rest upon the two his of the Glapes. Strike the middle of the stick widently I & you may see it broken cleanly without breaking the glupes. If the two Extremities of the stick rested upon two threads hung up perpendicularly, we might we the same Efect. When the riolent, but succeptive Impression reaches the hor Extremities of the stick they are Elevated in proportion as the me glapes or threads the more than they machine the flip Elevation removes to the glapes or threads the more soon whereby they would on more the property the property the property than the property the property than the property the property the property than the property the property the property than the property the property than the property that the property than the prope

is a Bitumen which the waves of the rea throw upon amber The Goasts, where it is hardned by Told & Heat 9,79 a violent agitation a sort of heat caused by subbing in the suffile or friend matter of amber & other Electrical Bodies makes a kind of votex ipue out of them as out of the Eardstone whose Celenty at first Comprehes M. Expells the air but in a short timethe Compresed & Expelle air is dilated & becomes within drives the Chafts other light Bodies toward the ambu Tirebrand . The Eatinguished fire Brand throws out more smoke, because the particles, which a rapid motion before dipipated are united having lost a great deal of their force, or compose aftogather a map of groß parts, which pap of in smoak. 9.376. after ruthing the Kands with the Juice of a bristed orion they may be washed in helted lead without onion hice any Injury. or any burning Coals may be taken up without dammage. The Frice which covers the skin & fills the pores on the surface of the hands, tinde the action of the Burning Coals to mother End from

on the hand. Ferson who make a Frade of handling 127 Fire & holding it in the mouth, make use sometimes Fire of an Equal mischerer of spirit of sulphur, salt armoni Esence of Rosemary of the Juice of Anions. If the Except of the action of five is great it makes a sensi is what they call burning. The Body & this spends In dipipating the fine particles which make Eggs fluid hardens them much after the same manner as it hardens Dirt. the reason a kettle with hot at the bottom after has refel before the liquor boils is because then the particles of it is hother fire have found a papage of are les reflected when the back again whereas before it boils the Corpuscles water does are reflected rowards the bottom & by their reflection which causes the heat with any many many the agitation which causes the heat with the agitation which which causes the heat with the agitation which which which which we will be agitation which which which will be agitation which will be agitation which will be agitation with the agitation which will be agitation with the agitation which will be agitation which will be agitation which will be agitation with the agitation which will be agitation with the agitation which will be agitation which will be agitation which will be agit to the agitation which will be agit to the agit the agit the agit to the agit the agi Vol. years why the air of the middle Region is generally air the Colder than that which Environs us seemes to fe this heason of that the air we breath is put into a Continual agitation warmer by the Rays of the sun Reflected from a thousand different here than to arts of the Earth, while that in the Fordele Region in she middle hasty a direct Imprepion from the rays of the sun.

(5) The Rays differently reflected, by the Inequalities of the East, cannot raise their action so high for this reason we find the Tops of high mountains Covered with snow in summer, Even between the Tropicks. 9150 acids & alkalies are two species of talk very differ acids the deids are like darts stiff, long, pointed reged. The Alkalies are Corpuseles more große Radhy, Alkalies porous & Spongey, like somany Theaths & seabland, propper to receive the Acids. J.38. when the salt of Tartar per Deliquium being power into the solution of any metal precipitates the Treupitationnetal & makes it fall dow to the fottom of the Befol in the form of mud, does not this argue to the acid particles are attracted more strong by the Salt of Tartar, than by the metal, & by the stronger attraction go from the metal to the last of gartar from the Doctrine of attraction & Repulsion all the Thanson in Chymistry teem capable of being accounted for solutions When agua Fortis of filings of Fron with a great heat & for caused. Ebullition is not it Effected by a violent motion of the

(6) parts of the Liquer rush towards the parts of the metal with biolence & tun forcibly into its pores. If one mise the totable spirit of sal armoniack with Congulations deliquious you will see a Congulation. The reason is kenting him nature the acids being absorbed into the alkali make with hem moleculo which otherupt the motion of theriging Spirit of hitre being powered hereon dipipates the Co agulum by the action of its points . 9. 82. To make the arbor Diano take 4 draws of fine tilber To make in filings, with a drams of mercury disolve them in 4 ounces of agua fortis after powring the tolution into some arter Driene of a Vint of water shake them a while & then keep them in a Bial well stopped. When you have a mind to use it take about anounce of it in a Thial & put therein the bignes of a pea of mercury & let the Thial rest & in a few minutes you will see small perpendicular threads arise which in less than a quarter will make a sort of a startown for the Arbor marks. upon a tolution of from made by pint The of hitre drawn of by distillation from the dipoliced from of whor which the Sulphureous & Inflamable parts are carried offer marks. it, power into a glap after the Ebullition bil of Partar per deliquirum. Etit vest voya will see a fino soul in a short time and

To make ThiloTophical grapes take one bune of sal amoniack disolve it in four ounces of Grapes Burgundy or Champaign to Expose this rolution Thilosoph to the run in a Dutch ring, there will be formed Low made. grains some what like mulberries & fixed to some small oblong & multiform heads full of Certain stalks. The Flowers of sal armoniack will produce full as fine ones in Common water. Tulvis The action of the Corpuscles of the fire, which minua Fulminans themselves into this mischere arries the points of the hitre into the pores of the salt of Tartar & the dilatation of the Internal air, whose springs play almost at the same time, gives the air this brotent agitation which makes the Thundring noise. I. 63. Jut sea water into a lucurbites of Considerable height Covered with its own head & let in the sun after such a manner that the sun may warm it without during how made it rays up on the Top, the fall will remain in the dishable Cheurbite & you will find in the receiver very good & white water this is an Experiment of m' gantier this gate man also found out the secret of taking away the sulny & Bilternels from tea water by putting a turning Coal ison

(8) the water itself, Is he was not affair of obliging himself to furnish a thip with a quantity of water sufficient for 408 men while at rea. that the salt & water thus seperated when mixed have nothing in them disagreeable to the Taste or unwholesome the reason Jeams to be this that as the salt is seperated from the water when hiered Composes Certain groß molecule which prick but without penetrating far or wounding. On the Contrary when they have been for a long hime Exposed to the action of the Jea water, they are divided & diminished, that they ponets too much into the organs of sence, tear them, wound them stop the course of the spirit swell the Fibers & shorten them. thence proceeds comitings &c. J. 82. mineral see springs. Jubber raneous fires are hansient for Every Terrestial body being once kindled is dispipated, but the heat of mineral waters has subtisted for several ages, whence then can their heat proceed, from some rubternamen fumes & bapours such as are to be seen in deep mines in Hungary, or from some mischere of minerals, From, sulphur & the like. 9138. Sleep how caused, why fat Persons are more subject to it was Landanum & Eaven frames Excite it. see sleep. steep.

To know whether a Child was shill born or not you went put a Siece of the thilds langs in water. if it sink to the bottom, the reseicles to know whether Contain no air, & the Child has therefore never a Child was shill born or not. drawn freath; For there always remains some air in the vesticles after respiration. of the Fiece of the Lungs float, the vesicles Contain some air & therefore the Child has drawn breath Consequent it lost its life after it was born. 9198. The Reason some animals leep the winter is, that transpiring attle & to much lep as the Esto shutsup swallows the pores of the skin, the fat that papes from its was they steep Cellules into the Blood, is sufficient for nourishing the Winter. & Tempering it a long time of as it has little heat, the spirit are not agitated sufficiently to awake The animals. but when the heat of the reason ryon to be felt, or the fat being Consumed, the Blood become hotter & more agitated, the spirit make forceable impr epions & the animals awake, Gramp fish see Gramp fish. agitation that paper into the minute particles of the

Fiber without wowning them, the reason is because a great franche in the new of the foot most apollo of the second a great many nervous fiber terminate in the wife of the Foot. (10) Thowers delight the smelling les after great hears than in time of a moderate one. because an Ene opivo Evaporation at least Exhausti the Emanations of Boriferous Corpuscles. In the morning the Rose thelf has scarcely any scent, because the loto hinders the Evapora besides the offactory herves are not so free in the Everning but more Incumbered with Humour. The Eaving is the most furtful of odours because in the heat the Corpuseles, which are Evaporated from the Howers are too much attenuated. but after the heat being left attenuated, more united by the lots, & more grofs they are in a better Condition to make tensite Impressions. The difference of Rours anse from the difference of the map, the figure & motions of the Comunities Those that are too grop, too pointed, or too much agitated, topa a greate smell; because those that are too grop, now the organs for much; there that are too pointed penetrate be far; & those that are too much agitated do both & tear the organ. forpuscles of a moderate smallief more round & les sharp whose agitation is neither too feele nor too strong blease the sence of smelling because they only tickle it with

scent the longest, because they Exhale only small Corpuses (11) Sometimes an Coour which pleases at a Certain distance becomes insupportable when nearer. The reason is, because being nearer it wounds the Organ of smelling by the Except of its motion. Tometimes from two obours by him selves there arises a third when mixed one Can ranchy swan because the historic renders the molecule too grof , too thong & capable of wounding the Organ. I on the Contrary from too gisagreeable ones, a plesant one fome mells wound to much as to Cause death as that of wild Gennyroyal to the Lattle rattle make the smell of which will kill him in haff an snake hour Probably the smell stops the papages of respiration in kills by these animals, or ferments with the klood to asto suffects Hornel them whether by tearing the papages of the Blood, or by toyal. Shutting up there of the spirit. 9238 In Enogul they make repels of the Earth of Jatna which nave of Earth is to light, that sometimes one may see them fluther on Earth bout at pleasure of the winds. The water in these bytes Earth. takes the smell & takes of the Earth & become delicious bu What is still more Extraordinary after they have drunk the Delicious water, they greedily Eat up the bottle itself inso

(12) to Eat up dishes, pots, bottles, & all the Expels of the House . P. 236. huisical Instruments the Floer the better see Instruments. The reason one hears a Buzzing when one puts ones Fingure into one Ear seems to be because the air which is between the finger & the Sympanum, & is agitated by the Corpuscles, which Ifme out of the finger by transpinh Thikes he tympanum. 2 66 Page Water is lep liquid than air, the rays fine in water papage water who that are more direct, more free, lep shothingted & lefs it regards In cum bered with Corpuscles, which might oppose the lip han an chirection of the rays & divide their force. glass is more totio, it contains up air than the water does reing it is more weighty & the air it contains is les agitated hina the papages of light in it are more free than water. There is no Body whose smallest parts are not transparent If metals be disolved in menstruums they become Franspan Opacity does not (as is commonly Imagined) happen Spacity whence it in Bodies because the way through which the light proceeds. might Laps, Is stopped by particles of matter. but it is required for spacity that the light should be reflected & deflicted from a right line for which there is only required the reperation of two mediums let us conceive which bodies Consult & seperated from one another to Fores

(13) & that those Interstices are Either void or fills with a medium whose density is different from that of particles, if light Enters such a Tody it will every moment fall upon a surface dividing mediums differing in density; Merefore it will andergo Innumerable reflection Is refractions in that body so as not to be able to get through it. hence we see that spacity depends upon the Fores for if you fill the pores with a medium of the same density as the particles of the Fories themselves, the light will converge no reflection or repraction in the bog but papes directly through & the Body will be transparen the we cannot make Experiments whereby to fill the Yores of a Body with a medium Exactly of the same density as the particles, yet the following Experiments will Clearly Enough prove or Stace her ton's Doctrino Concerning Opacity. Exp., Taper becomes more transparent when moistned with water; for it fills the Fores & differs lep in density from the particles than air does. Bit has the same Effect. Exp: 2 take a Freaof glass & Inches thick, & take several plates of the same fort of glap laid one upon another but so as not to be quito the Inches thick & you will find the there will be less transparent than the Folid Ricco

(14) because of the air between the Plates which does 132 not get into the solid Frece where all the parts Cohere dip these into water & they will be more transparent than when the Interstices were fills only with air. 3 Exp: let any transparent Liquid that may be Changed into Froth be thaked, till it be full of Bubbles it will Immediately become spaker by reason of the Interstices that are fill with air as Turpentine & water, bil water. We clearly see in all these cases that opacity is produced because there is a medium of different density between the transparent parts which may also be observed in the Clouds which are spake on account The air Interposed between the particles of the water. some opake Bodies reflect a little light & the rest of the light by Innumerable divisions it undergoes in the reflections & refractions above mention is Extinguished in the body; Such are Black Bodies. Tometimes a green headow, appears all white at a distance & when you look upon a glap of red wine miat with water you donot distinguish in appearance heither The parts of water nor the solid parts of the glass the Tensation formed in the tout only represents to you red home without interruption. The reason is becaused

(15) Imprepion that come from the red wine is stronger than those which come from the glap & water, & the throngest being spread all about upon the Retina, remon the other Imperceptable? Coloured objects draw all our attention, when they are mixed with others. The reason a person going from a well lighted place into a dark one can see nothing at first is because the Supel that was Contracted in the well lighted place in order to keep out the rays that might injure the organ of sight; remains this contracted for some time in the dark, to does not admit a sufficient quantity of the feelle Rays for perceiving Pojects. 9. 949. Convex the teason it presents offects smaller to mirour. the reason of its stinging see hettle. Why does Bodies appear differently Colored, because the figure of their pores & the texture & Consistano Golows of their parts reflect more rays of one kind reflect more ray of me kind white they transmit the greaters part of the others or abort them. Red booles for Examp reflect more red rays. accordingly being plunged into Homogenous rays of this Colour, they thereby appear to be to Lighter red. Gold relies yellow rays while the suffer others

(16) to pass through, for if one place a very him place of gold between the light is the Eye, the light pipes through it & appears blewish & greenish. Howmany glapes transmitt certain Colours the moment they Jefleet others. 9.982 ho Suice of the red on the Raich makes drops of the Frain of temon with change to find the state for three gatts now in water some white thind, Foak some gatts now in water half a day filtrate them seperately witnot to they will Each be transparent. Birschem & they make a Hack. The Farticles of the vitriol & galls being hooked togather in the minture form molecula hig & solid Enough to that up the papages of light & porous & yelding Enough to absorb it with out making it recoil to as to make an Empression on the organ of sight Gower a little agua Fortison this mixtures & it becomes trasparent because the acid by distipating the molecula restores the paper of the light, 9385. The rolution of Corrosive sullimate & oil of Jarhan sublimate per deliquium mised will appear red, the Each is Corrosive seperately transparent. the liquors being thickened by mixing reflect the red rays which Each of the Liquors when reperate at paps, upon this miseture

(17) put a little spirit of sal ar montac & the mixton will be as white as milk. That is because the mixture reflects at once a great quantity of rays of all kinds. a little agua fortis make this diapp the sharp Foints of the aguafortis disporting the Instecutor restores the transparency. 9.387. In the horthern Countries several animals are white in the number & another Colour in the summer the reason of which is, the Escreptive told birdsup the pores of the skin & also the small pipes of the Birds in air, hinders Jujees from moistning the hair. he hair northern bands dry'd up as that on evens heads for want of mousture. in winter being dryed up it has its unperceptable parts more nogo & otherwing more Elastick, & Consequently it reflects more Effectual in summer. tays on all sides & with more force, hence procue the whiteness of some animals in winter in other Seasons the coto binds up the pores of the thin & the pipes of the hair lep. the hair receives more humed Juices its Imperceptable parts are thereby lep rugged & Elastic; whence it comes to pass, that The whiteness is left, & the animals returned the Common Colour of this species. 9:397.

(18) after you have attentively looked upon the sun shut your Eyes you still see a white, but in a little time The white is Change into a gellow, the yellow into a red, the red into a green, the green into a flue, he flue into a sioletet the violet into a black in proposi on as the force of the bibrations is abated. 9:403. Ink Invisible see Ink. In winter Reopte set over the Chimney a sort of glass bottles full of water. upon the surface of the water they put the roots of Roots of July, aremony Jonguil, the the heat of the fire is communicated to the water. the agitated particles of water penetrate the roots &s Explicate them. you see the Roots descend who the water, the shank ascend, & Flowers grow in the height of winter. vol3 98th let a little plant be hirned uprive down, the root will & ought to discend & rock into the Earth Roots why as it is the heaviest its Escep of gravity gives its they grow a direction down wards. on the Contrary the stack ought to ascend because it attracts the refined but down ward. see grafting. when one approaches this Hant with the hand, there I pre spirit out of the fuger by transpiration. There the ponetrate the fiber of the plant Interrupt the course of Sensitive

Frices is stop the tirculation. The Circulation of the Fibers being stopt, there are fibers which swell is sink. This seems to be the sensibility of the sensitive plant. 942. Mos is a Tree in ability whose leaves are so large Enjeto that two of them are sufficient to lover a man behind & before. They hang rooms with them, they make use of them for carpets, for napkins & tonds Is the green of them is very fine. They gind the Granches or Mick Ribs of the lawes, & reduce them into a very fine & white meal, which being soaked & boile with wilk is delicious food; the Frunk & roots are more hourishing than the branches. They art the brunck into pieces like Turnips & boil them with heat. often times the wealthy themselves Eak them by way of regale. 944 Plants qualadies of them see Plants. Scarlet. The grain of this proceeds from a kind of small Icara baus, Esvered with very fine down, being attached hips the leaves near the Tedjeler & deposits in the hipsing the Egg of a worm, which at last produces a small

20 Fly. The Juice being stopt, by the hipping & by the gas ouxes out. a Tumour arises, & formes grains of about two lines diameter. The grains are fills with a substance of a very tively red. 9:49 Sheep in agaa dito some seeds, tethice, Colliflow, sallet &c mise with mould some staked time reduced into Sowar Plant with a little Igeons dung in twice 24 hours you will productionhave a lettice, Colleflowers, sallet. Do. of them in Would you have Farsley ; soak some Farsley seed in time. Vinagar & after having sown it in good Eath, throw upon it plenty of the Ashes of Bean Cods; after that sprinkle the Earth with spirit of wine & cover it well with Cloths. the Farsley will spring upon few Hours. If you design to raise pease & Beans quickly, nothing is required but to put them in hot oil for the space of hine days & then to grind & son them. The beans & pease with spring up in an Kour The Rook of trees tiko the stomach of man, receive the hours ament, digest, after & Change it mto hubitive Juice. Accordingly one may observe, when Ever the houn hment has paper from the root into the stalk that it has taken a particular odour, Colour & Tasto. The action of the air meliorates the Jujees in the Frunk. The Keat of the sun refines them there, by the agitation & division of their particles. I & B

To Trees why they put out later see Trees. Leaves : their use see Leaves. Fruit Now rippied see Fruit. Turnsolo Plants how to preserve them. Is intaid Floors. see Flants.
In the Antibles, Every thing shoots forth in the Winter the Frelds there are then lovered with green. the reason is, in hose Blands the winter is Eaven hot in the summer the Hants are burnt up with Exceptive heat: 4:68 Eggs how hatched. Chicken ovens in Egypt. see Eggs. Between the Frozicks the vapours raised are so abundant Torrie zone The day time, that they fall again in rain the why hattinkly hole night; which temperates the Exceptive heat & senders there Country's Habitable notwithstanding the burning heat of the sum. 9.93 Lightnings whence the repeated flather seem to proceed see lightning. ain bow. Phainomena Mereof Explained. so Rainbow. moon no atmosphere. see moon. Terrefying of the water of springs have been fills in the Earth prings bank grains of rand with small stones scarcely percept

22. Inch as are found is he petrefying Fountain of feremo in avergno here little stones there little grains of Fand being sunk by the agitation of the water into The pores of Certain Bodies which Encounter with them penetrate the same without king able to get out again The Bodies thereby become more maky more sons more hard. some particles of different kinds being Carryo of by the water in its passage over particular springs trata will penetrate like small Everges. from hence prom many proper Bobies. if the Waters of Fountains have paper from the paper aplaint or puscles make the teeth fall out have they washed of their corpuscles Capable of Fearing the fibers of the Body of fixing. Corrupting the Blood or Causing obstructions; they are pemicious. on the Contrary if they pap through play Where they receive Corpouscles for for rendring the Island fluid for dipipating obstructions, for facilitating the Circulation of the Blood they are wholesome as the water of bath. Ipau in Germany & several other les noted places. if they with him oily places they are tily. If they carry off with them talk the fermentation if hey are told above & not beneath to his

the fine or agitated parts of the surface are Easily dipipated & Those of the Bottom being stoot for the upper parts, unite their forces again & by that means produce that degree of agitation which is the Cause of Reat. if they are low in the day time or hot at night his because the hear of the Day dipipates the rapour too much to cause and sensible agitation: whilst the coto of the higher detains consenses & reunites. if in their course they encounter places ful of ruphur or Bitumen they abound with those spirits. These volatile spirits rise & hover over the surface of he Fountain which in some will Immediately Catch by alm or Forch. The Dapours of these waters are soon dipipated by Carriage. Jules Thy: rol 2 9123. Water may be devided into the Three Tollow ing heads nt heetalline or Divretick as those of Funbridge in Kent, astrop in horthamptonshire. Knarsburgh & Scarburgh in york thire & span ing 2 Jaline or Gathartick as Epsom in Juny. Barnet in middle on hothhall in Hertfordshire . These abound as it is plain by leaving Considerable quantities behind them upon Evaporation. 3. Suphurous or hot baths. as Bath in Somersets. Buchon in Deligan Bladder Blown up with air by a Child whose ventis Stoped with very little force Can support an Anvil of six hundred pounds the internal air & weight being in Equilibrio

24 because there is a reciprocal proportion of mup & Iniffield. Tupport now the lungs & breast are the Bladter as m' senae has one 0/600 Potends . observed. The glotis is a vent that is Easily stopped. Therefore one can support an anvil of 600 Yound upon ones breast without Breast. any delusion. They wpon whome this operation is performed vog enerally Laivingson a Hank the middle whereof pield to the strokes of a hammer, to that any one may support upon the breast an anvil of six hundred Founds & the strokes of a hammer which breaks a bar of Fron on the anvil anvil. for by reason of the Exceptives map of the anvil it has much less miftness than the hammer. The freat sinks down only in proportion as the anvil descends & the anvil can only descend one line which the breast Can Easely Fear. let us suppose for Example that the hamme weight one quarter of a Sound, & that it has one degree of mithies the anvil of 600 pounds being beat uponty The hammer is diffused into 2400 parts Every one of which 11 Equal to it. Jal: Phy. vol 2 9 203. If the atoms wherewith the lignor is fully Impregnated do relate & open themen that the light may fairly generate, then is the Eigner Limit & Bear but if they draw up a tible Closer one to mother, so that the light be refracted, then is the Ligner jellow, if Elever yet to a greater he tracked Tight. of light, then is the liquor red, if to close that not light can be hairen 5 Hours through them then will it be black but it the mast cannot break he front of them then will it present a guilk white see & gover microgers

Take a tincture of Brasil wood flings in luke warm water filter & Clarify it, to a Glass of which and a few doops of singer Glours & swith him it a fine ale Estar? a Frankushing you put in Stead there of a lettle Sal of Factor's will him it a Claret Colour into which a flux drops of out of Stiniol dopped with change to a fine sack Elsur. Corrosive subtimat & Byl of Tartar the Clear when separat man a red mixture to which a little Pal armonia con added 44 mischure will become white. This a little agua fortis with reduce again to a transparent tignid.

26 for the Leginning of this turn back to Page yo 65: 128/ 11: upon the coming home of one of these Bres laden There seen above to or 12 Bees at work to discharge one single Bee of the wax he has brought home & Convey it to others which were Employed in building & framing the Cells, some authors fell us that he Theen Bee whichis always farger than the rest is toth mother & Lucen to the whole following in wer find by Experience, that where this governous is wanting the whole live decays & Comes to ruine. at Swarming time, Execially 3 or 4 Evenings before they are going out, the Encen appears at the mouth of the River as is quarded at that Kime by 4 or 3 ranks of Bees, which Hand before her in traight lines fluttering their wings, & making a hoise without moving from their place, leaving from mough between the ranks for the labouring bees to pass but -wards & forewards. Their swarming time is generally in. may. when they ofserow them Inclinable to fly away they fling dust amongst them & if out of reach the firm a Fishet will make them settles Sumeriately. which I think is reasonable Enough Considering how much a approaching storm makes them king to their Rives. I suppose by prefing the air in an Extraordinary man such as the firing of a fun or Sistol will do. for a not of the Robbenics Battles burying their Dead & Prefer to no accad transfer the year 1412.

heact to these we may place the Jehneumon flies, which have generally 4 transparent wings 6 legs, the body divided into 3 of Toynted by Fender refsels like the Bee's. Some of these lay non their Eggs in the Parenchymous part of leaves & fruit flies hences bak bernes & Oak apples, others in the hympha or Caterpollar of Insects, which has made some mishes the Aurelia of Certain Kinds of Butherflies, for the aurelies of Ichneumon flies. Beekles were a race of Insects whose first food is for the most part, the wood & Bark of Frees, Some of there have pinchers, tike the horns of Bucks & Stags, Others have Their steads trustating the Sinoceros; others horns likely I sometimes resembling the snout of an Elephant which makes ses destinguish them by the hames of, Bull Ballis Stag Beetles Se. The Lady is of this Cated Kind. this Insect very much resembles the Cond Cochinect, Tady lows winged have been often found in Cochincel which his very probable is that Insect in its mature state. I had a present made mes of some Tochinal Cathincel found by one of the american staves formerly Employed by the Spaniards in that Trade on the Indian by in Carolina which proved to be julias good as that from the Spanish west more have b legs assiece. Then two hind ones are Chiefly disposed for managementaising themselves fill they can take wing. They have a thinging the back which is not remarkable in any trisect Except the death rakhalich Sean give no decount of their manner of senerating or how they are brought forth, or proceed to their winged states. This abstract your on at 9. 39 in the letter V.

